

ANCIENT ABORIGINAL TRADE IN NORTH AMERICA

Charles Rau



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CHARLES RAU.

REPRINTED FROM THE REPORT OF THE SMITHSONIAN
INSTITUTION FOR 1872.

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BY CHARLES RAU.

The following essay was published in German, Vol. V of the *Archiv für Anthropologie* (Braunschweig, 1872); but as the subject is purely North American in character, the author has deemed it proper to prepare a version in the language of the country to which it refers. The present reproduction, however, is enlarged and improved.

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INTRODUCTION.

Indications are not wanting that a kind of trade or traffic of some extent existed among the prehistoric inhabitants of Europe, even at a time when they stood comparatively low in the scale of human development. The same practice prevailed in North America, before that part of the new world was settled by Europeans; and as the the subject of primitive commerce is of particular interest, because it sheds additional light on the conditions of life among by-gone races, I have collected a number of data bearing on the trade-relations of the former inhabitants of North America. The fact that such a trade was carried on is proved, beyond any doubt, by the frequent occurrence of Indian manufactures consisting of materials which were evidently obtained from far distant localities. In many cases, however, these manufactures may have been brought as booty, and not by trade, to the places where they are found in our days. The modern Indians, it is well known, sometimes undertook expeditions of a thousand or twelve hundred miles, in order to attack their enemies. The warlike Iroquois, for example, who inhabited the present State of New York, frequently followed the war-path as far as the Mississippi river. Thus, in the year 1680, six hundred warriors of the Seneca tribe invaded the territory of the Illinois, among whom La Salle sojourned just at that time, preparing to descend the Mississippi to the Gulf of Mexico.* More than a hundred years ago, the traveler

* Morgan, *League of the Iroquois*, Rochester, 1851, p. 13. More precise information concerning this memorable expedition is to be found in the writings of Hennepin, Membre, Lahontan, and others.

Carver learned from the Winnebagoes (in the present State of Wisconsin) that they sometimes made war-excursions to the southwestern parts inhabited by Spaniards (New Mexico), and that it required months to arrive there.* Similar excursions and migrations, of course, took place during the early unknown periods of North American history. In the course of such enterprises the property of the vanquished naturally fell into the hands of the victors, who appropriated everything that appeared useful or desirable to them. The consequence was an exchange by force—if I may call it so—which caused many of the manufactures and commodities of the various tribes to be scattered over the face of the country. This having been the case, it is, of course, impossible to draw a line between peaceable barter and appropriation by right of war, and, therefore, while employing hereafter frequently the terms “trade” or “exchange,” I interpose that reservation which is necessitated by the circumstances just mentioned.

Of the Indian commerce that has sprung up since the arrival of the Europeans I shall say but little, considering that this subject has sufficiently been treated in ethnological and other works on North America; and I shall likewise omit to draw within the sphere of my observations that interesting trade which was, and still is, carried on between the tribes inhabiting the high north of Asia and America, where Behring's Strait separates the two continents. My attention is chiefly directed to the more ancient manufactures occurring in Indian mounds and elsewhere; and the distribution of these relics over distant parts of the country, in connection with the known or presumed localities which furnished the materials composing them, forms the basis of my deductions. Thus, my essay will assume an *archæological* character, and for this reason I shall confine my remarks to that part of the United States concerning whose antiquities we possess the most detailed information, namely, the area which is bounded by the Mississippi valley (in an extended sense), by the Great Lakes, the Atlantic coast, and the Gulf of Mexico.

A number of archæologists make a distinction between the builders of the extensive mural earthworks and tumuli of North America and the tribes whom the whites found in possession of the country, and consequently separate the relics of the so-called mound-builders from those of the later inhabitants. Such a line of demarcation certainly must appear totally obliterated with regard to the relations which I am about to discuss, for which reason I shall by no means adhere to this vague division in my essay, but shall only advert to the former Indian population in general.

In the following sections I have first treated of a number of materials which formed objects of trade, either in an unwrought state or in the shape of implements and ornaments; and subsequently, in conclusion, I have made some observations tending to add more completeness to my preceding statements.

* Carver, Travels, &c., Harper's reprint, New York, 1838, p. 42.

COPPER.

Every one knows that the region where Lake Superior borders on the northern part of Michigan abounds in copper, which occurs here in a native state and in immense masses, the separation of which and raising to the surface contribute in no slight degree to the difficulties of the mining process. Long before Europeans penetrated to those parts, the aborigines already possessed a knowledge of this wealth of copper. This fact became known in 1847, at which time the traces of ancient aboriginal mining of some extent were pointed out in that district. The circumstances of this discovery and the means employed by the natives for obtaining the copper being now well known, a repetition of those details hardly would be in place, and I merely refer to the writings relating to this subject.*

Copper was, indeed, the only metal which the North American tribes employed for some purposes before their territories were colonized by Europeans. Traces of wrought silver have been found, but they are so exceedingly scanty that the technical significance of this metal hardly can be taken into consideration. Gold was seen by the earliest travelers in small quantities (in grains) among the Florida Indians;† yet, to my knowledge, no object made of gold, that can with certainty be attributed to the North American Indians, has thus far been discovered.‡ The use of copper, likewise, was comparatively limited, and cannot have exerted any marked influence on the material development of the natives. The copper articles left by the former inhabitants are by no means abundant. As an example I will only mention that, during a sojourn of thirteen years in the neighborhood of St. Louis, which is particularly rich in tumular structures and other tokens of Indian occupancy, I did not succeed in obtaining a single specimen belonging to this class. Copper implements, such as axes, chisels, gravers, knives, and points of arrows and spears, have been found in the Indian mounds and in other places; but most of the objects made of this metal served for ornamental purposes, which circumstance alone would go far to prove that copper played but an indifferent part in the industrial advancement of the race. If the ancient inhabitants had understood the art of melting copper, or, moreover, had nature furnished them with sufficient supplies of tin ore for producing

* Squier and Davis, *Ancient Monuments of the Mississippi Valley*, Smithsonian Institution, Washington, 1848. Foster and Whitney, *Report on the Geology and Topography of the Lake Superior Land District*, Part I, Washington, 1850. Schoolcraft, *Indian Tribes of the United States*, Vol. I, Philadelphia, 1851. Lapham, *The Antiquities of Wisconsin*, Washington, 1855. Whittlesey, *Ancient Mining on the Shores of Lake Superior*, Washington, 1863. Sir John Lubbock, *Prehistoric Times*, London, 1865, &c.

† See: Brinton, *Notes on the Floridian Peninsula*, Philadelphia, 1859, Appendix III.

‡ In the Smithsonian Report for 1870, just published, the occurrence of gold beads in a mound near Cartersville, in the Etowah valley, Georgia, is recorded. Native gold is said to be found in the neighborhood, (p. 380.)

bronze, that peculiar composition which the Mexicans and Peruvians employed, their state of civilization doubtless would have been much higher when the whites arrived in their country. They lacked, however, as far as investigations hitherto have shown, the knowledge of rendering copper serviceable to their purposes by the process of melting, contenting themselves by hammering purely metallic masses of copper with great labor into the shapes of implements or articles of decoration. These masses they doubtless obtained principally, if not entirely, from the copper districts of Lake Superior.* Owing to the arborescent or indented form under which the copper occurs in the above-named region, nearly all copper articles of aboriginal origin exhibit a distinct laminar structure, though quite a considerable degree of density has been imparted to the metal by continued hammering. It must be admitted, furthermore, that the aborigines had acquired great skill in working the copper in a cold state. From an archæological point of view this peculiar application of natural copper is certainly very remarkable, and, therefore, has often been cited, both by American and European writers. To the native population, however, the comparatively sparing use of copper cannot have afforded great material aid, and its chief importance doubtless consisted in the promotion of intercourse among the various tribes.

The first travelers who visited North America saw copper ornaments and other objects made of this metal in the possession of the natives, and very scrupulously mention this fact in their accounts, while they often leave matters of greater importance entirely unnoticed. This cannot surprise us, considering that the first discoverers were possessed of an immoderate greediness for precious metals, and therefore also paid particular attention to those of less value. The Florentine navigator, Giovanni Verazzano, who sailed in 1524, by order of Francis the First of France, along the Atlantic coast of North America for purposes of discovery, noticed, as he states in his letter to the French king, on the persons of the natives pieces of wrought copper, "which they esteemed more than gold." Many of them wore copper ear-rings.† In the narrative which the anonymous Portuguese nobleman, called the Knight of Elvas, has left of De Soto's ill-fated expedition (1539-'43) it is stated that the Spaniards saw, in the province of Cutifachiqui, some copper axes, or chopping-knives, which apparently contained an admixture of gold. The Indians pointed to the province of Chisca as the country where the people were familiar with the process of melting copper or another

* Some of the natives of the northernmost part of the United States, lately purchased from Russia, worked copper before the European occupation. Their industry was, of course, entirely independent of that here under consideration. (See, for instance, Von Wrangell, *Russische Besitzungen an der Nordwestküste von Amerika*, St. Petersburg, 1839.)

† The Voyage of John de Verazzano, in Collections of the New York Historical Society, Second Series, Vol. I, New York, 1841, pp. 47 and 50.

metal of a lighter color and inferior hardness.* It is very natural that these gold-seeking adventurers should have anticipated everywhere traces of that valuable metal; and concerning the statements of the Indians in relation to the melting, it is well known how apt the crafty natives always were to regulate their answers according to the wishes of the inquirers. Yet, notwithstanding these improbabilities, the fact remains that the natives of the present Southern States used implements of copper some centuries ago. Indeed, I have seen in the collection of Colonel Charles C. Jones, of Brooklyn, copper articles of the above description, obtained in the State of Georgia. When Henry Hudson discovered, in 1609, the magnificent river that bears his name, he noticed among the Indians of that region pipes and ornaments made of copper. "They had red copper tobacco-pipes, and other things of copper they did wear about their necks." Robert Juet, who served under Hudson as mate in the *Half-Moon*, relates these details in the journal he has left behind.† Additional statements of similar purport might be cited from the early relations concerning the discovery of North America.

While Messrs. Squier and Davis were engaged, more than twenty years ago, in surveying the earthworks of the Mississippi valley, more especially those of the State of Ohio, they found in the sepulchral and so-called sacrificial mounds a number of copper objects, which they have described and figured in the work containing the results of their investigations.‡ They also met small pieces of the unwrought natural metal in some of the mounds. The copper specimens obtained during this survey were formerly in the possession of Dr. Davis, one of the explorers, and I had frequent occasion to examine them. At present they form a part of the Blackmore Museum, at Salisbury, England, to which institute Dr. Davis sold his valuable collection. They are either implements, such as axes, chisels, and gravers; or bracelets, beads, and other probably ornamental objects, exhibiting quite peculiar forms, which were, perhaps, owing to the singular methods employed in fashioning the copper into definite shapes. The axes resemble the flat celts of the European bronze period, and doubtless were fastened in handles like the latter. Some of the bracelets of the better class are of very good workmanship, the simple rods which form them being well rounded and smoothed, and bent into a regular circle until their ends meet. I have seen quite similar bronze bracelets in European collections. The objects just described obviously have been fashioned by hammering; others, however, consisting of hammered copper sheet, received their final shape by *pressure*. To these belong certain circular concavo-convex discs, from one and one-

* Narratives of the Career of Hernando de Soto in the Conquest of Florida, as told by a Knight of Elvas, and in a Relation by Luys Hernandez de Biedma, Factor of the Expedition. Translated by Buckingham Smith. New York, 1863, p. 72.

† Journal of the Voyage of the *Half-Moon*, in Collections of the New York Historical Society, Second Series, Vol. I, 1841, p. 323.

‡ Ancient Monuments of the Mississippi Valley, pp. 196-207.

half inches to two inches in diameter, which have been likened to the bosses observed on harnesses. Concerning their use, nothing is definitely known, but it is presumed that they were destined for purposes of ornament. The manipulation of pressure was likewise employed in making smaller articles of decoration resembling the convex metal buttons still seen on the clothes of the peasantry of Germany and other European countries. However, in minutely describing these remarkable products of aboriginal art, I would merely repeat what already has been stated, detailed accounts being given in the well-known work of Messrs. Squier and Davis.

Although the fire on the hearths or altars now inclosed by the sacrificial mounds* was sometimes sufficiently strong to melt the deposited copper articles, it does seem that this proceeding induced the ancient inhabitants to avail themselves of fire in working copper; they persisted in the tedious practice of hammering. Yet one copper axe, evidently cast, and resembling those taken from the mounds of Ohio, has been ploughed up near Auburn, in Cayuga County, in the State of New York.† This specimen, which bears no traces of use, may date from the earlier times of European colonization. It certainly would be wrong to place much stress on such an isolated case. The Indians, moreover, learned very soon from the whites the art of casting metals. For this we have the authority of Roger Williams, who makes the following statement in reference to the New England Indians; "*They have an excellent Art to cast our Pewter and Brasse into very neate and artificiall Pipes.*"‡

In the Lake Superior district, resorted to by the aboriginal miners, there have been found, besides many grooved stone hammers (sometimes of very large size) and rude wooden tools, various copper implements, such as chisels, gads, &c., and some spear-heads in which, in lieu of a socket, the flat sides at the lower end are partly bent over,§ a feature also peculiar to certain European bronze celts, which, on this account, are denominated "winged" celts.

The copper-lands of Northern Michigan, it has been stated, were visited by the aborigines for the sake of obtaining copper at a period anteceding the arrival of the whites. It is probable that small bands of various northern tribes made periodical excursions to that locality, returning to their homes when they had supplied themselves with sufficient quantities of the much-desired metal. The indications of permanent settlements, namely, burial-places, defensive works, traces of cultivation and

* For a precise description of the remarkable stratified mounds denominated "sacrificial," I must refer to the "Ancient Monuments of the Mississippi Valley." Burned human bones being often discovered in them in connection with manufactured objects, Sir John Lubbock suggests that these mounds are of a sepulchral rather than a sacrificial character. (Prehistoric Times, first ed., p. 219, &c.)

† Squier, *Aboriginal Monuments of the State of New York*, Washington, 1849, p. 78.

‡ Roger Williams, *A Key into the Language of America*; Providence, 1827, p. 55. (Reprint of the London edition of 1643.)

§ Whittlesey, *Ancient Mining*, &c.

dwellings, &c., are wanting, and the small number of chaseable animals, indeed, offered but little inducement to a protracted sojourn. The question, at what time the natives ceased to resort to the mines, has been answered in various ways. Mr. Whittlesey is of opinion that from five to six hundred years may have elapsed since that time, basing his argument on the growth of trees that have sprung up in the rubbish thrown out from the mines; Mr. Lapham, on the other hand, believes in a continuance of the aboriginal mining operations to more recent periods, and thinks they were carried on by the progenitors of the Indians still inhabiting the neighboring parts, although they possess no traditions relative to such labors. Probably as early as the first half of the seventeenth century the French of Canada entertained with those tribes a trade that provided the latter with iron tools, and the ornaments and trinkets so much coveted by the red race. Thus, the inducements to obtain copper ceased, and the practice of procuring it being once discontinued, a few centuries may have sufficed to efface the tradition from the memory of the succeeding generations. Yet, like many other points of North American archæology, this matter is still involved in obscurity, and it would be hazardous, at present, to pronounce any decided opinion on the subject.*

The occurrence of native copper in the United States is not confined to the shore of Lake Superior. As I am informed by Professor James D. Dana, it is also met, in pieces of several pounds' weight, in the valley of the Connecticut river, and likewise, in smaller pieces, in the State of New Jersey, probably originating in both cases from the red sandstone formation. Near New Haven, Connecticut, a mass was found weighing ninety pounds. Such copper finds may have furnished a small part of the metal worked by the aboriginal inhabitants; its real source, however, must be sought, in all probability, in the mining district of Lake Superior. It is a remarkable circumstance that the native copper, there occurring sometimes incloses small masses of native silver, a juxtaposition which, as I believe, is not to be observed at any other place in the United States; and just such pieces in which the two natural metals are combined have been taken from a few of the tumuli of Ohio.

Though copper articles of Indian origin are comparatively scarce in

* The Indians certainly are a forgetful race. The traveler Stephens, who has examined and described the grand ruins of ancient buildings in Yucatan and the neighboring states, maintains—and I believe on good grounds—that these erections, at least in part, are the work of the same Indian populations with whom the conquistadores (Hernandez de Córdova, Grijalva, Cortés) were brought into contact during the sixteenth century. The present descendants of the builders of those magnificent works have preserved no recollections of their more advanced ancestors. Whenever Stephens asked them concerning the origin of the buildings, their answer was, they had been erected by the *antiguos*; but they could not explain their destination; they were unacquainted with the meaning of the statues and fresco paintings, and manifested in general a total ignorance of all that related to their former history.

the United States,* the field of their distribution, nevertheless, is very wide, extending from the Great Lakes to the Gulf States, and from the Atlantic coast to the Mississippi, and, perhaps, some distance beyond that river. Taking it for granted, as we may do, that the northern part of Michigan is the point from which the metal was spread over that area, the traffic in copper presents itself as very extensive as far as distance is concerned. The difficulties connected with the labor of obtaining this metal doubtless rendered it a valuable object, perhaps no less esteemed than bronze in Europe, when the introduction of that composition was yet of recent date. The copper probably was bartered in the shape of raw material. Small pieces of this description, I have already stated, were taken from the mounds of Ohio, and larger masses occasionally have been met in the neighborhood of these works. One mass weighing twenty-three pounds, from which smaller portions evidently had been detached, was discovered in the Scioto valley, near Chillicothe, Ohio.† Of course, it is impossible at present to demonstrate in what manner the copper trade was carried on, and we have to rest satisfied with the presumption that the raw or worked copper went from hand to hand in exchange for other productions of nature or art, until it reached the places where we now find it. Perhaps there were certain persons who made it their business to trade in copper. I must not omit to refer here to some passages bearing, though indirectly, on the latter question, which are contained in the old accounts of Hernando de Soto's expedition. Garcilasso de la Vega speaks of wandering Indian merchants (*marchands*), who traded in salt.‡ The Knight of Elvas is still more explicit on this point. According to him, the Indians of the province of Cayas obtained salt by the evaporation of saline water. The method is accurately described. They exported salt into other provinces, and took in return skins and other commodities. Biedma, who accompanied that memorable expedition as accountant, likewise speaks in various places of salt-making among the Indians.§

GALENA.

It has been a common experience of discoverers that the primitive peoples with whom they came in contact manifested, like children, a remarkable predilection for brightly-colored and brilliant objects, which, without serving for any definite purpose, were valued merely on account of their external qualities. The later North American Indians exhibited

* The Smithsonian Institution has been receiving for years Indian antiquities from all parts of North America, yet possessed in 1870 only seven copper objects; namely, three spearheads, two small rods, a semilunar knife with convex cutting edge, and an axe of good shape. Professor Baird was kind enough to send me photographs and descriptions of these articles.

† *Ancient Monuments, &c.*, p. 203.

‡ *Conquête de la Floride, Leide, 1731, Vol. II, p. 400.*

§ *Narratives of the Career of Hernando de Soto, &c.*, p. 124. Biedma, pp. 152, 153, and 257.

this tendency in a marked degree, and their predecessors, whose history is shrouded in darkness, seem to have been moved by similar impulses. Thus the common ore of lead, or galena, was much prized by the former inhabitants of North America, though there is, thus far, no conclusive evidence of their having understood how to render it serviceable by melting. Quite considerable quantities of this shining mineral have been met in the mounds of Ohio. On the hearth of one of the sacrificial mounds of that State, Messrs. Squier and Davis discovered a deposit of galena, in pieces weighing from two ounces to three pounds, the whole quantity amounting perhaps to thirty pounds. The sacrificial fire had not been strong enough to convert the ore into pure metal, though some of the pieces showed the beginning of fusion.* As stated before, there is no definite proof that the aborigines were acquainted with the process of reducing lead from its ore; for as yet no leaden implements or ornaments have been discovered that can be ascribed with certainty to the former population. The peculiarly shaped object of pure lead figured on page 209 of the "Ancient Monuments," which came to light while a well was sunk within the ditch of the earth-work at Circleville, Ohio, was perhaps made by whites, or by Indians at a period when they already had acquired from the former the knowledge of casting lead. This curious relic is in possession of Dr. Davis, and I have often examined it. The archaeological collection of the Smithsonian Institute contains not a single Indian article of lead, but quantities of galena, which were taken from various mounds. Yet, supposing the Indians had known the fusibility of galena, the lead extracted therefrom could not have afforded them great advantages, considering that its very nature hardly admitted of any useful application. "Too soft for axes or knives, too fusible for vessels, and too soon tarnished to be valuable for ornament, there was little inducement for its manufacture."—(Squier and Davis.) However, in making net-sinkers, it would have been preferable to the flat pebbles notched on two opposite sides, which the natives used as weights for their nets. Pebbles of this description abound in the valley of the Susquehanna and in various other places of the United States, especially in the neighborhood of rivers.

The frequent occurrence of galena on the altars of the sacrificial mounds proves, at any rate, that the ancient inhabitants attributed a peculiar value to it, deeming it worthy to be offered as a sacrificial gift. The pieces of galena found in Ohio were, in all probability, obtained in Illinois or Missouri, from which regions they were transferred by way of barter, as we may presume, to the Ohio valley. No original deposits of galena are known in greater proximity that could have furnished pieces equal to those taken from the mounds of Ohio.

*Ancient Monuments, pp. 149 and 209.

OBSIDIAN.

The peculiar glass-like stone of volcanic origin, called obsidian, which played such an important part in the household of the ancient Mexicans, has not been met *in situ* within that large portion of the United States (probably of North America in general) that lies north of Mexico and to the east of the Rocky Mountains. Messrs. Squier and Davis, nevertheless, have found obsidian in the shape of points for arrows and spears and cutting implements, though mostly broken, in five mounds of the Scioto valley, in Ohio; an object made of this material was likewise found in Tennessee,* and the numerous unopened mounds of the United States may inclose many more articles of this class. The copper used by the Indians, it has been seen, occurs as a product of nature within the area over which it was spread by human agency; it is different, however, with regard to obsidian, and the question therefore arises, from what region the builders of the large inclosures and tumuli in Ohio obtained the last-named mineral. Obsidian, we know, is found in the present territory of the United States on the western side of the Rocky Mountains. Captain Bonneville noticed, about forty years ago, that the Shoshonees or Snake Indians in the neighborhood of Snake river (or Lewis river) used arrows armed with points of obsidian, which, he adds, abounds in that vicinity.† The latter fact is confirmed by Samuel Parker, who found, some years later (1835), in the volcanic formations of that region, "many large and fine specimens of pure obsidian or volcanic glass."‡ According to Wyeth, the Shoshonees also employ sharp obsidian flakes of convenient shape as knives, which they sometimes provide with handles of wood or horn. The same author mentions the frequent occurrence of obsidian in the district inhabited by the Shoshonees.§ It is known that various tribes in New Mexico, Arizona, and neighboring parts, Apaches, Mojaves, and others, frequently employ obsidian in the manufacture of their arrowheads.

Mr. John R. Bartlett, from 1850 to 1853 commissioner of the United States for determining the boundary line between the latter and Mexico, found pieces of obsidian and fragments of painted pottery along the Gila river, wherever there had been any Indian villages; and also among the ruins of the *Casas grandes*, in Chihuahua, as well as those of the Gila and Salinas rivers.|| The same observation has been made by earlier and later travelers. The natives of Upper California employ obsidian extensively for making arrowheads. Mr. Caleb Lyon, who

* Troost, *Ancient Remains in Tennessee*, in: *Transactions of the American Ethnological Society*, New York, 1845, Vol. I, p. 361.

† Irving, *Adventures of Captain Bonneville*, New York, 1851, p. 255.

‡ Parker, *Exploring Tour beyond the Rocky Mountains*,* Ithaca, New York, 1844, p. 98.

§ Wyeth, in *Schoecraft's Indian Tribes*, Vol. I, p. 213.

|| Bartlett, *Personal Narrative*, &c., New York, 1854, Vol. II, p. 50. Compare: Humboldt, *Essai politique sur la Nouvelle-Espagne*, Paris, 1825, Vol. II, p. 243, and Clavigero, *History of Mexico*, Philadelphia, 1817, Vol. I, p. 151.

was, about ten years ago, among the Shasta Indians in California, saw one of the tribe engaged in making arrowheads from obsidian as well as from the glass of a broken porter-bottle. He describes the method of manufacture in a letter which was published by the American Ethnological Society.* To this letter I shall refer in a succeeding section of this essay, when treating of the division of labor among the North American Indians. Mr. Bartlett visited, while in California, a locality in the Napa valley (north of San Francisco), where obsidian occurs in pieces from the size of a pea to that of an ostrich egg, which are imbedded in a mass resembling a coarse mortar of lime, sand, and gravel. He found the surface in many places covered, from six to twelve inches in depth, with broken pieces and small boulders of this volcanic substance. The appearance of these spots reminded him of a newly-made macadamized road.†

The most extensive use of obsidian, however, was formerly made in Mexico, before the empire of the Aztecs succumbed to the Spanish invaders. Old obsidian mines are still seen on the *Cerro de Navajas*, or "Hill of Knives," which is situated in a northeasterly direction from the city of Mexico, at some distance from the Indian town Atotonilco el Grande. These mines provided the ancient population of Mexico with vast quantities of the much-prized stone, of which they made those fine double-edged knives, arrow and spear-heads, mirrors, very skilfully executed masks, and ornaments of various kinds. Humboldt speaks of the Hill of Knives in a transient manner;‡ for a precise description we are indebted to the meritorious English ethnologist, E. B. Tylor, who visited that interesting locality in 1856, while traveling through Mexico in company with the late Mr. Christy.§ In describing the mines, Mr. Tylor says: "Some of the trachytic porphyry which forms the substance of the hills had happened to have cooled, under suitable conditions, from the molten state into a sort of slag, or volcanic glass, which is the obsidian in question; and, in places, this vitreous lava, from one layer having flowed over another which was already cool, was regularly stratified. The mines were mere wells, not very deep, with horizontal workings into the obsidian where it was very good and in thick layers. Round about were heaps of fragments, hundreds of tons of them; and it was clear, from the shape of these, that some of the manufacturing was done on the spot. There had been great numbers of pits worked, and it was from these *minillas*, little mines, as they are called, that we first got an idea how important an element this obsidian was in the old Aztec civilization. In excursions made since, we traveled over whole districts in the plains where fragments of these arrows and knives were to be found

* Bulletin of the American Ethnological Society, New York, 1861, Vol. I, p. 39.

† Personal Narrative, Vol. II, p. 49.

‡ Essai politique sur la Nouvelle-Espagne, Vol. III, p. 122.

§ Tylor, *Anahuac: or Mexico and the Mexicans, Ancient and Modern*, Lond., 1861. This volume contains, besides many facts relating to the archæology and ethnology of Mexico, the best observations on obsidian I have found in any work on that country.

literally at every step, mixed with morsels of pottery, and here and there a little clay idol.*

From the centre of the State of Ohio to the country of the Shoshonees, as well as to the Rio Gila, and the just-described mines in Mexico, the straight distances are almost equal, measuring about seventeen hundred English miles; indeed, the Mexican mines are a trifle nearer to Ohio than the above-mentioned districts. It would be lost labor, therefore, to indulge in speculations from which of these localities the obsidian found in Ohio and Tennessee was derived. The number of articles of this stone that has been met east of the Mississippi is so exceedingly small that its technical significance hardly deserves any consideration. Yet, the sole fact of finding worked obsidian at such great distances from the nearest places where it occurs either in

* *Anahuac*, p. 99. The following interesting communication was addressed to me by Dr. C. H. Berendt:

"During one of many excursions which I made in the years 1853-56 around the Citlaltepētēl, or Pico de Orizaba (in the State of Vera Cruz), I saw an obsidian mine on the western slope of that mountain. I had heard of it from my friend the late Mr. C. Sartorius, who had visited the place years ago. I was informed that the Indians of the village of Alpatlahua knew the place, but that they did not like to have it visited. Some say they have treasures hidden in the caves of the neighborhood; while others believe that they have idols in those lonely places which they still secretly worship. The cura of San Juan Coscomatepec, who was of this latter opinion, gave me the name of a mestizo farmer in the neighborhood who might be induced to show me the place. Our party followed from Coscomatepec the road which leads to the rancho Jacal and the pass of La Cuchilla. We did not find the mestizo at home, but his wife, who directed her boy to show us the cave. Reaching the bridge of the Jamapa river, we took a by-road parting to the north, which brought us to the village of Alpatlahua, and about four miles farther north to a branch of the Jamapa river, which we crossed. We then left the road and proceeded about half a mile up the river through thick woods, when we found ourselves suddenly before the entrance of the cave. It was about fifty feet high and of considerable width, but obstructed by fallen rocks and shrubs. Heaps of obsidian chips of more than a man's height filled the bottom of the grotto, which had apparently no considerable horizontal depth. To the left the mine was seen, an excavation of from six to eight square yards, the bottom filled up with rubbish and chips. Obsidian, evidently, had not only been quarried, but also been made into implements at this spot, the latter fact being proved by the occurrence of cores, or nuclei, of all sizes, from which flakes or knives had been detached. We were not prepared for digging, and it was too late for undertaking explorations that day. So we left, with the purpose to return better prepared at another time, hoping to find some relics of the miners and workmen, and, perhaps, other antiquities. But it happened that I never had an opportunity to visit the place again. Mr. Sartorius saw in this cave three entrances walled up with stone and mortar, but these I did not discover, having, as stated, no time for a careful examination. Future travelers, I hope, will be more successful.

"Mr. Sartorius mentioned another place, likewise in the State of Vera Cruz, where obsidian formerly was quarried. This place is situated in the chain of mountains extending from the Pico de Orizaba to the Cofre de Perote." One of the intervening mountains, called Xalistac, is distinguished by a white spot that can be seen at the distance of many miles, even at Vera Cruz. It is produced by an outcropping of pumice-stone resting on an immense mass of obsidian that has been worked in various places. I know the mountain well, but not the road leading to it, never having traveled in that direction."

situ or in consequence of human agency (as, perhaps, on the Gila), is in itself of importance, for it furnishes an additional illustration of the far-reaching communications among the aborigines of North America.

MICA.

Like the shining galena, mica (commonly called isin-glass), was a substance held in high estimation by the former inhabitants; but, while the first-named mineral apparently fulfilled no definite purpose, being deemed valuable merely for its brilliancy, the latter was often made into articles of ornament, a purpose for which it certainly was well fitted on account of its metallic lustre. It is also said to have been used for mirrors. Mica is found in the tumuli in considerable quantities, sometimes in bushels, and is often ploughed up in the neighborhood of old earthworks. It occurs in sepulchral mounds as well as, though more rarely, in those of supposed sacrificial character. In the former the plates of mica are placed on the chest or above the head of the skeleton, and sometimes they cover it almost entirely. If I speak here of "plates of mica," the expression is to be taken literally, it being known that this mineral occurs in some of the eastern parts of North America in masses of considerable size, as, for instance, in New Hampshire, where pieces of from two to three feet in diameter have been observed.

The most important archæological finds of mica, as far as I know, occurred in Ohio. Of some of them I will give here a brief account.

Mr. Atwater has left a very accurate description of the earthwork at Circleville, Ohio, now mostly obliterated, which consisted of a large circular and adjoining quadratic embankment. In the centre of the circle there arose a sepulchral mound which contained two skeletons and various objects of art, among which was a "mirror" of mica, about three feet long, one foot and a half wide, and one inch and a half in thickness. Atwater found these so-called mirrors at least in fifty different places in Ohio, mostly in mounds. "They were common among that people," he says, "and answered very well the purpose for which they were intended. These mirrors were very thick, otherwise they would not have reflected the light."* It has been doubted, however, whether the objects served as mirrors. It is true, every one who has come in contact with the modern Indians knows how eager they are, prompted by vanity, to obtain from the traders small looking-glasses, which they often carry about their persons in order to contemplate their features, or to have them on hand when they are about to paint their faces, or to eradicate their scanty growth of beard. Yet, after all, I am inclined to believe that Atwater's so-called mirrors were nothing else but those large plates of mica, probably of symbolic character (as will be seen), which have frequently been met since the publication of his account.

In the year 1828, during the digging of a canal near Newark, Ohio, one of the low mounds frequent in that neighborhood was removed. It

* Atwater, in: *Archæologica Americana*, Worcester, 1820, Vol. I, pp. 178, 225.

contained fourteen skeletons in a high state of decomposition, which were covered with a regular layer of mica plates. The latter were from eight to ten inches in length, four or five inches wide, and from half an inch to an inch in thickness. The quantity of mica thrown up from this mound amounted to *fifteen or twenty bushels*.*

During their archaeological investigations, Messrs. Squier and Davis frequently found mica in the mounds, and they have given precise accounts of their discoveries. In one of the sacrificial mounds near Chillicothe, Ohio, they came upon a layer of round plates of silvery mica, measuring from ten to twelve inches in diameter, which overlapped each other like the tiles or slates on a roof, and were deposited in the shape of a half-moon. The excavation laid bare more than one-half of this crescent, which could not have measured less than twenty feet from horn to horn. The greatest width (in the middle) was five feet. It has been thought that the shape of this curious deposit of mica might be suggestive of the religious views of the builders of the mound, and imply a tendency to moon-worship.† Another mound not far from the preceding one—both belonged to a group of twenty-three within an inclosure—likewise contained mica.‡ The circular cavity of the altar in this mound was filled with fine ashes intermixed with fragments of clay vessels and some small convex copper discs. Over these contents of the basin a layer of mica sheets, overlapping each other, was spread like a cover, which, again, served as the basis for a heap of burned human bones, probably belonging to a single person.§

The authors of the "Ancient Monuments" also found occasionally in the mounds ornaments made of thin sheets of mica, cut out very neatly and with great regularity in the shapes of scrolls, oval plates, and discs, and pierced with small holes for suspension or attachment. They doubtless were intended to embellish the dress of persons of distinction.|| Dr. Davis has some of these ornaments which, fastened on black velvet, almost might be taken for silver objects, the mica of which they are made being of the perfectly opaque kind. Ornamental plates of mica, further, were met in the large Grave-Creek Mound, situated twelve miles below Wheeling, in Western Virginia. This burial-mound, which is one of the highest in the United States—it is seventy feet high—was opened in 1838. Near one of the skeletons, one hundred and fifty rather irregularly-shaped thin sheets of mica, from one inch and a half to two inches in size, were collected. They were all provided with two or more holes for stringing them together, and had evidently formed a scarf or some other article of personal adornment.¶

* Ancient Monuments, p. 72.

† Ancient Monuments, p. 154.

‡ This earthwork, called "Mound City" by Squier and Davis, will be described in a subsequent section.

§ Ancient Monuments, p. 145.

|| Ancient Monuments, p. 155; representations on p. 240.

¶ Schoolcraft, in: Transactions of the American Ethnological Society, Vol. I, p. 399.

The preceding quotations, to which others of similar purport might be added, will suffice to show how much mica was valued by the former inhabitants of the Mississippi valley; indeed, the frequent and peculiar occurrence of this mineral in the mounds almost might justify the conjecture that it was believed to be invested with some mysterious significance, and played a part in the superstitious rites of the aborigines. Mica has been found in a worked and raw state in districts where it is not furnished by nature, and therefore may be safely classed among the aboriginal articles of exchange. In the State of Ohio, to which my observations chiefly refer, mica is not found *in situ*, and it is presumed that the mineral discovered in that State was derived from the southern spurs of the Alleghany Mountains. Yet, it may have been brought from greater distances, and from various points, to its present places of occurrence.

SLATE.

Various kinds of ancient Indian stone manufactures frequently consist of a greenish slate, which is often marked with darker parallel or concentric stripes or bands, giving the objects made of it a very pretty appearance. This slate is not very hard, but of close grain and therefore easily worked and polished. The objects made of this stone, which occur on the surface as well as in mounds, are generally executed with great care and regularity, and it is much to be regretted that the destination of some of them is not quite well known. Among the latter are certain straight tubes of cylindrical and other shapes and various lengths, which sometimes terminate in a kind of "mouth-piece." While the smaller ones, which often measure only a few inches, have been thought to represent articles of ornament, or amulets, a different purpose has been ascribed to the longer specimens. Schoolcraft appears to consider these latter as telescopic instruments which the ancient inhabitants used for observing the stars. This view, I think, has been generally rejected. It is far more probable that these tubes, in part at least, were implements of the sorcerers or medicine-men, who employed them in their pretended cures of diseases. They applied one end of the tube to the suffering part of the patient and sucked at the other end, in order to draw out, as it were, the morbid matter, which they afterwards feigned to eject with many gesticulations and contortions of the body. Coreal calls the tubes used by the medicine-men of the Florida Indians a kind of shepherd's flute (*une espèce de chalumeau*) and the character of some of the stone implements in question that have been found certainly justifies this comparison.* Kohl saw, as late as 1855, one of the above-mentioned cures performed among the Ojibways of Lake Supe-

* Coreal, *Voyages aux Indes Occidentales*, Amsterdam, 1722, Vol. I, p. 39.

rior; in this instance, however, the tube used by the medicine-man was a smooth hollow bone, probably of the brant-goose.*

A far more numerous class of articles often made of the greenish striped slate is represented by small, variously-shaped tablets of great regularity and finish, which are pierced in the middle with one, two, or more round holes. The most frequent shape of these tablets is illustrated by the upper figure on Plate 28 in Vol. I of Schoolcraft's work on the Indian tribes. It is that of a rectangle with sides exhibiting a slight outward curve. The full-size drawing of this rather large specimen is done in colors, and thus affords the advantage of showing the greenish tint and the markings of the stone. Other tablets are lozenge-shaped, quadratic with inwardly-curved sides, oval, cruciform, &c.† Most of them have two perforations, though specimens with only one are not scarce, while those that have more than two holes are of less frequent occurrence. The holes are drilled either from one side or from both, and, accordingly, of conical or bi-conical shape. They seldom have more than one-eighth of an inch in diameter at the narrowest part. Concerning the destination of the tablets nothing is definitely known. At first sight one might be inclined to consider them as objects of ornament or as badges of distinction; but this view is not corroborated by the appearance of the perforations, which exhibit no traces of the wear produced by continued suspension, being, on the contrary, in most cases as perfect as if they had but lately been drilled. The classification of the tablets as "gorgets," therefore, may be regarded as erroneous. Schoolcraft calls them implements for twine-making. It has been suggested that they were used in condensing and rounding bow-strings by drawing the wet strips of hide, or the sinews employed for that purpose, through the round perforations. The diameter of the latter, it is true, corresponds to the thickness of an ordinary Indian bow-string; but also in this case the usually unworn state of the holes rather speaks against this supposition.

Being desirous to learn whether Mr. George Catlin had seen, during his first sojourn among the western tribes, anything like those tablets used by them in making bow-strings, I availed myself of that gentleman's return to the United States, and asked him by letter, among other matters, for information concerning this subject. He replied (December 24, 1871) as follows:

"Of the tablets you speak of, I have seen several, but the holes were much larger than those you describe. Those that I have seen were

* Kohl, *Kitschi-Gami, oder Erzählungen vom Obern See*, Bremen, 1856, Vol. I, p. 148. Compare: Venegas, *History of California*, London, 1759, Vol. I, p. 97, and Baegert's *Account of the Aboriginal Inhabitants of the Californian Peninsula*, Smithsonian Report for 1864, p. 386. Drawings of the stone tubes are given on pp. 224-27 of the "Ancient Monuments of the Mississippi Valley."

† The various shapes of these tablets, and of other perforated objects, not exactly tablets, but probably intended for the same purpose, are represented on pages 236 and 237 of the "Ancient Monuments."

used by the Indians for grooving the shafts of their arrows. All arrows of the primitive Indians are found with three grooves from the arrow's shoulder, at the fluke, extending to, and conducting the air between, the feathers, to give them steadiness. These grooves, on close examination, are found to be indented by pressure, and not in any way cut out; and this pressure is produced, while forcing the arrow, softened by steam, through a hole in the tablet, with the incisor of a bear set firmly in a handle and projecting over the rim of the hole as the arrow-shaft is forced downward through the tablet, getting compactness, and on the surface and in the groove a smoothness, which no cutting, filing, or scraping can produce. It would be useless to pass the bow-string through the tablet, for the evenness and the hardness of the strings are produced much more easily and effectually by rolling them, as they do, between two flat stones while saturated with heated glue."

Thus, Mr. Catlin's experience is rather unfavorable to the supposition that the pierced stone tablets mentioned by me were used in condensing bow-strings. Yet, after all, they probably served for some similar purpose, which may be clearly defined hereafter by continued examination and comparison. I regard them as implements, and not as objects of ornament or distinction.*

The greenish slate is frequently the material of another numerous class of Indian relics of enigmatical character. I allude to those curious articles bearing a distant resemblance to a bird, which are pierced at the base with diagonal holes, evidently for suspension, the traces of wear being distinctly visible. They probably represent insignia or amulets. I have also heard the suggestion that they were used for removing the husk of Indian corn.†

Of much rarer occurrence than the articles thus far enumerated in this section are perforated implements somewhat resembling an axe with two cutting edges, or, more often, a double pick-axe, which, doubtless, were provided with handles and worn as badges of distinction by the superiors.‡ These objects are for the most part elegantly shaped, but of small size, and cannot have been applied to any practical use, their material, moreover, consisting generally of soft stone, more particularly of the greenish slate in question. It is evident, therefore, that they fulfilled a symbolical purpose, and were employed in the manner just mentioned.

* The Smithsonian Report for 1870, which has appeared since the above was written, contains, among other ethnological matter, an account of an exploration of mounds in Kentucky, by Mr. Sidney S. Lyon. Among the contents of one of the mounds was "a black stone with holes through it." *I have seen this kind of an instrument, says Mr. Lyon, used by the Pah-Utes of Southeastern Nevada, for giving uniform size to their bow-strings.* (p. 404.)

† A group of these singular objects is represented on page 239 of the "Ancient Monuments."

‡ Schoolcraft gives on Plate 11, Vol. I, of his large work, two colored half-size representations of such implements, which he calls "maces."

Having now briefly described the most important classes of relics made of the striped slate, I pass over to the principal point of inquiry, namely, the extent of their occurrence. I know from personal experience that they are found from the Atlantic coast to the Mississippi river, a distance about equal to one-third of the whole breadth of the United States. It is possible that they are scattered over a far greater area. In 1848, when Squier and Davis published their work, in which aboriginal manufactures were for the first time accurately described, they could not specify the locality from which the oft-mentioned slate was derived. Since that time geological surveys have been made in all States of the Union, and the places of its occurrence are no longer unknown. It appears, I am informed, as the oldest sedimentary formation, in quite considerable masses along the Atlantic coast, and has been observed from Rhode Island to Canada. This slate is not believed to occur in other parts of the Union, and it may be presumed, therefore, that it was brought from the Atlantic coast-districts, either in a rough or already worked condition, to the more western regions of the United States.

FLINT.

The real flint (*Feuerstein* in German) which is found abundantly, in rounded pieces or nodules in the cretaceous formations of the countries bordering on the Baltic, of England, France, &c., and which has played such an important part in the prehistoric ages of Europe, does not seem to occur within the United States. For this information I am personally indebted to Professor James D. Dana. On the other hand, many parts of this country are very rich in various kinds of stones of a silicious character, which, in consequence of their hardness and conchoidal fracture, were well fitted to replace the missing variety in the production of chipped implements. The term "flint," therefore, is used here in a rather extensive sense, comprising hornstone, jasper, chalcedony, ferruginous quartz, sweetwater quartz, milky quartz, semi-opallic stones, &c., and the numerous transitions from one quartz variety into another, for which the science of mineralogy has no special denominations. The common white quartz, also, I may remark in this place, and the transparent rock-crystal, were used for pointing arrows; and in districts where harder stones were scarce, even slates and greenstones served as substitutes for them in the fabrication of arrow and spearheads.

As in Europe, so also in the United States, places have been discovered where the manufacture of flint implements was carried on. These "open-air workshops" (*ateliers en plein air*) are by no means rare in North America, and they begin to attract considerable attention since the successful archæological researches in Europe have stimulated to similar pursuits in this country. As the North American tribes all used the bow, and consequently were in constant need of arrowheads, the manufacture of the latter took place in many localities, especially in such as furnished the stones most proper for that purpose. The *Kjoek-*

kenmoedding at Keyport, New Jersey, described by me in the Smithsonian Report for 1864, evidently was one of the places where flint implements were made by the natives. I not only saw there among the shell-heaps countless chips of flint, but found also a number of unfinished arrowheads, which had been thrown aside on account of a wrong crack or some other defect in the stone. The necessary material was here furnished on the spot, in the shape of innumerable water-worn pebbles of silicious character, which lie intermixed with the shells. Among the unfinished arrowheads picked up by me at this place there are some which exhibit a part of the smooth water-worn surface of the pebble from which they were made.

In the middle part of the Mississippi valley, where I lived many years, and had occasion to make various observations, the Indians were amply provided by nature with the material employed in the fabrication of spear and arrowheads. The prevailing rock of those regions is a limestone in which several of the varieties of the quartz family are found, either in layers or in irregular concretions. In the bluff formations of the "American Bottom" in Illinois, for instance, I have traced myself layers of hornstone, chalcedony, &c., for the distance of miles. In the districts under notice, moreover, the surface is covered here and there with many silicious pebbles and boulders, which furnished an inexhaustible supply of available material.

An important locality to which the aborigines resorted, perhaps from great distances, for quarrying flint, is in Ohio, on the line of a calcareo-silicious deposit, called "Flint Ridge," which extends through Muskingum and Licking Counties of that State. "The compact silicious material of which this ridge is made up," says Dr. Hildreth, "seems to have attracted the notice of the aborigines, who have manufactured it largely into arrow and spearheads, if we may be allowed to judge from the numerous circular excavations which have been made in mining the rock, and the piles of chipped quartz lying on the surface. How extensively it has been worked for these purposes, may be imagined from the countless number of the pits, experience having taught them that the rock recently dug from the earth could be split with more freedom than that which had lain exposed to the weather. These excavations are found the whole length of the outcrop, but more abundantly at 'Flint Ridge,' where it is most compact and diversified with rich colors."*

The Indian working-places of which I spoke are not always met in the neighborhood of those spots where flint was quarried or otherwise abundant, but also sometimes at considerable distances from the latter, in which cases they are, of course, of comparatively small extent. Their existence, however, proves that the material was transported from place to place, and thus assumed the character of a ware. Colonel

* Hildreth, in Mather's First Annual Report on the Geological Survey of the State of Ohio, Columbus, 1838, p. 31.

Charles C. Jones, of Brooklyn, who has paid particular attention to the former history of his native State Georgia, informed me he had observed quantities of silicious stone, surrounded by numerous rejected fragments and unfinished spear and arrowheads of the same material, in districts of that State where far and near no quartz minerals occur *in situ*. He showed me a number of these incomplete flint objects obtained from such places.

For the fact that stones for arrowheads formed an object of traffic among the natives, even historical evidence is not wanting. I refer to a passage in the relation of Cabeça de Vaca, the first European who has given an account of the interior of North America. The passage in question will be quoted in a subsequent section.

I am of opinion that flint in a half-worked state, that is, in flattish pieces roughly chipped around their circumference and presenting irregular heart-shaped, oval, or round outlines, formed an object of exchange, and as such was transported to places far distant from the sites which furnished the raw material. Those who quarried the flint fashioned it in this manner for the sake of saving space and for easier transportation. Smaller or greater quantities of such worked flint fragments of homogeneous character are sometimes found in the earth, where the natives had buried them, believing that flint splits more readily when recently taken from the ground. These deposits, however, are not always composed of pieces which required further chipping in order to receive their final shape, but also sometimes of finished implements. I have treated of these buried deposits of flint objects in an article published in the Smithsonian Report for 1868, to which I refer in order to avoid repetitions.* The agricultural implements of East St. Louis, described in that article, are very skilfully executed manufactures of the aborigines; the large flint discs, on the contrary, which, as I mentioned, Messrs. Squier and Davis found in great number in a mound of "Clark's Work" in Ohio, and the rude flint objects of elongated oval outline from the bank of the Mississippi between St. Louis and Carondelet, present, in all probability, only rudimentary forms of implements, and were destined to be finished at a future time. It cannot be doubted that the stone of which the discs of Clark's Work are made was derived from the quarries of Flint Ridge. This fact has been established by careful comparisons. The stone in question is designated as hornstone. It is a beautiful material, resembling in color and grain certain varieties of the real European flint, and is sometimes marked with darker or lighter concentric bands, the centre of which is formed by a small nucleus of blue chalcedony. These bands are particularly observable on the surfaces which have undergone a change of color by exposure. The stone, in general, possesses qualities by which it can be recognized at once, even when met in a wrought state far from its original place of occur-

* A Deposit of Agricultural Flint Implements in Southern Illinois, p. 401.

rence. According to Mr. Squier, arrowheads made of this hornstone have been found in Kentucky, Indiana, Illinois, and Michigan. That they occur in Illinois, I can attest from personal experience.

A very remarkable find of objects manufactured from the hornstone of Flint Ridge occurred in the summer of 1869 on the farm of Oliver H. Mullen, near Fayetteville, in St. Clair County, of the State of Illinois. Some children, amusing themselves near the barn of that farm, happened to dig into the ground, and came upon a deposit of fifty-two disc-like flint implements, which lay closely heaped together. I obtained a number of these implements through my indefatigable co-laborer, Dr. Patrick, of Belleville, Illinois. They coincide in shape with those of Clark's Work, but are somewhat smaller, and not, like the latter, superficially prepared objects, but highly-finished implements. This fact is shown by the careful chipping of the edges, to which sharpness and roundness have been imparted by small and carefully measured blows. Unlike the deposit of East St. Louis, which consisted of perfectly new implements, that of Fayetteville was made up of such as had already done service. To this conclusion I am led by the character of their edges, which exhibit a slight wear or polish. I regard these implements as *scraping* or *smoothing tools*, to which purposes they were well adapted by their shape; and I have but little doubt that the less finished discs of Clark's Work were to be converted, by further chipping, into implements of the same kind.

In connection with the object, however, which I have in view in this essay, the identity of the stone of Flint Ridge with that of which the tools found at Fayetteville in Illinois consist, is the point that deserves particular consideration. This identity admits of no doubt. I was convinced of it at first sight when I received the implements from Fayetteville, and so were Messrs. Squier and Davis, to whom I showed my specimens. The direct distance from the quarries at Flint Ridge to Fayetteville is about four hundred English miles, and thus far, at least, the stone was exported, in a rudimentary or finished shape, from its original site. So much is certain; but it is not unlikely that implements made of this hornstone will be found hereafter at still greater distances from the quarries in Ohio.

RED PIPESTONE.

The celebrated red pipestone, that highly-valued material employed by the Indians of past and present times in the manufacture of their calumets, occurs *in situ* on the Coteau des Prairies, an elevation extending between the Missouri and the headwaters of the Mississippi. This is the classical ground of the surrounding tribes, and many legends lend a romantic interest to that region. It was here that the Great Spirit assembled the various Indian nations and instructed them in the art of making pipes of peace, as related by Longfellow in his

charming "Song of Hiawatha." Even hostile tribes met here in peace, for this district was, by common consent, regarded as neutral ground, where strife and feuds were suspended, that all might resort unmolested to the quarry and supply themselves with the much-prized red stone. This material, though compact, is not hard, and therefore easily worked, and, moreover, capable of a high polish. It consists chiefly of silica and alumina, with an admixture of iron, which produces the red color. American, and probably also European, mineralogists call this stone Catlinite, in honor of the zealous ethnologist and painter, Catlin, who was the first to give an accurate account of its place of occurrence, and to relate the traditions connected with the red pipestone quarry.* This locality is the only one in North America where this peculiar stone is found, and it is doubtful, indeed, whether in any other place on both hemispheres a mineral substance is met which corresponds in every respect to the one in question.

The enterprising Jesuit missionary, Marquette, whose name is forever linked with the exploration of the Mississippi, smoked already in the year 1673 the pipe of peace with the Illinois Indians, and gives the following exact description of that important utensil, the bowl of which, it will be seen, consisted of the red stone of Coteau des Prairies. "It is made of a polished red stone, like marble, so pierced that one end serves to hold the tobacco, while the other is fastened on the stem, which is a stick two feet long, as thick as a common cane, and pierced in the middle; it is ornamented with the head and neck of different birds of beautiful plumage; they also add large feathers of red, green and other colors, with which it is all covered."[†] His ecclesiastical successors also frequently mention the red pipes in their writings, but none of them, as far as I know, alludes to the locality where the stone was obtained. The first notice referable to that place, I found in the "History of Louisiana" by DuPratz, and even his statement is totally erroneous as far as the situation of the quarry is concerned. "On the bank of the Missouri," he says, "there is to be seen a pretty high cliff (*écure*), which rises so abruptly from the water that the nimblest rat could not climb it. From the middle part of this cliff projects a mass of red stone, which is marked with white spots like porphyry, from which it differs, however, by inferior hardness, being almost as soft as tufa. It is covered by another kind of stone of no value, and rests upon the same sort of earth that forms the other hills. The inhabitants of the country, knowing the applicability of that stone, are in the habit of detaching pieces of it by arrow-shots, which pieces, falling into the water, are recovered by diving. From fragments of sufficient size they make calumets, using their knives and awls in manufacturing them. This stone can be

* Catlin, *North American Indians*, London, 1848, Vol II, Letters 54 and 55.

† Shea, *Discovery and Exploration of the Mississippi Valley*, New York, 1852, p. 35.

worked without difficulty and resists the fire very well.* Leaving aside the incorrect description of the locality and of the character of occurrence, the stone here mentioned corresponds exactly to that of Coteau des Prairies, the latter being, indeed, very often marked with lighter (though not white) spots, which give it a perfectly porphyritic appearance. I have seen many raw pieces of the red pipestone and have some myself, in which this peculiarity is prominently exhibited. The unworked stone is usually of a dull pale red, the heightened color appearing only after the process of polishing.

Carver, who explored the region of the Upper Mississippi in 1766-'68, mentions the red stone, but does not seem to have visited its place of occurrence, which he marks on his map as the "Country of Peace." He also states distinctly in his work that even individuals belonging to hostile tribes met in peace at the "Red Mountain," where they obtained the stone for their pipes.† This shows that, at his time, the neutrality of the district was still respected. This laudable regulation, it also appears, had not yet become obsolete in the beginning of the present century, for on the map accompanying the work in which Lewis and Clarke describe the territories explored by them in 1804-'6, the locality in question is thus designated: "Here the different Tribes meet in Friendship and collect Stone for Pipes." Yet, about forty years ago, when Catlin visited the Coteau des Prairies, the warlike Sioux or Dakotahs had usurped the exclusive authority over the quarry, not permitting their enemies to provide themselves with stone. Catlin and his English traveling companion encountered at first difficulties on their way to the quarry, a band of those Indians trying to prevent them from going there. "As this red stone," the warriors said, "was a part of their flesh, it would be sacrilegious for white men to touch or take it away; a hole would be made in their flesh and the blood could never be made to stop running."‡ When, subsequently, after Catlin's return from the quarry, an old chief of the Sacs saw some pieces of the red stone in the traveler's possession, he observed: "My friend, when I was young I used to go with our young men to the Mountain of the Red Pipe and dig out pieces for our pipes. We do not go now, and our red pipes, as you see, are but few. The Dakotahs have spilled the blood of the red men on that place and the Great Spirit is offended."§

Mr. Catlin is of opinion that the Indian quarrying operations at Coteau des Prairies reach back into far remote times, basing his view

* Du Pratz, *Histoire de la Louisiane*, Paris, 1758, Vol. I, p. 326. The passage in question is not quite clear. It remains doubtful whether DuPratz, in speaking of the stone resembling porphyry, relates what he has heard himself, or alludes to the journal of M. de Bourgmont, to which he refers on the preceding page. The last-named cavalier undertook, in 1724, an expedition to the country of the Padoucas, or Comanches. The erroneous account may be due to the natives, who purposely misplaced the locality of the quarry.

† Carver, *Travels*, p. 78.

‡ Catlin, Vol. II, p. 166.

§ Ibid., Vol. II, p. 171.

chiefly on the traditions of the Indians, which certainly indicate a comparatively long acquaintance with the locality. It appears, however, hardly admissible to ascribe a *very* high antiquity to the quarry, considering that thus far no pipes or objects of ornament made of the red stone have been discovered in the oldest tumuli of the Mississippi valley, and the results of a recent examination of the Coteau des Prairies by Dr. F. V. Hayden likewise tend to detract much from the supposed antiquity of this aboriginal place of resort. According to Dr. Hayden, the layer of Catlinite, hardly a foot in thickness, rests upon a gray quartzite, and there are about five feet of the same gray quartzite above it, which the Indians had to remove with great labor before the pipestone could be secured. A ditch from four to five feet wide and about five hundred yards in length indicates the extent of work done by the Indians. Only about one-fourth of the pipestone layer, thin as it is, can be used for the manufacture of pipes and other objects, the remainder being too impure, slaty, or fragile. Dr. Hayden describes the place as unpicturesque and deficient in trees. He found no stone implements in the vicinity, nor did he learn that any had ever been found; rusty iron tools, on the other hand, are frequently discovered. According to his view, the quarry belongs to a comparatively recent period.†

Nevertheless the fact seems to be well established that the surrounding tribes resorted for many succeeding generations to this locality, and that it formed a neutral ground, which they approached with a kind of superstitious awe. The Indians looked upon the red stone as a particularly valuable gift of the Great Spirit, and Catlin relates from personal observation that they humbly sacrificed tobacco before five huge boulders of granite near the quarry, in order to acquire the privilege, as it were, to take away a few pieces of the stone.‡ At present the settlements of the whites are advancing toward that interesting spot, which lies now, indeed, within the State of Minnesota, close to its western border, and in a county to which the name "Pipestone" has been given. A communication from Dr. Hayden informs me that the place is still visited by Dakota Indians, but not very frequently, and without the observance of those ceremonies which formerly appeared indispensable. Not much longer, however, will the red man be seen to make his pilgrimage to the quarry of Coteau des Prairies.

Mr. Catlin has published very good drawings of the red pipes, which are, moreover, familiar to every one who has paid some attention to Indian matters. Some of them bear testimony to the skill and patience of their makers, who, in most cases, probably possess no other implements than the knives and files obtained from the traders. The cylindrical or conical cavities in the bowl and neck of these pipes are drilled with a hard stick and sharp sand and water.‡

* Hayden, in *American Journal of Science and Arts*, Vol. XLIII, January, 1867.

† Catlin, Vol. II, p. 166.

‡ Catlin, Vol. I, p. 234.

Not long ago a small Catlinite pipe of unusual shape was sent to me, which had been ploughed up in a maize-field near Centreville, in Southern Illinois (St. Clair County). Such older specimens are even met in the New England States, near the Atlantic coast. The collection of the Smithsonian Institute contains some pipes and ornaments made of Catlinite, which were taken from Indian graves in the State of New York, or obtained from the Iroquois still inhabiting the same State. The raw or worked red pipestone, therefore, constituted an article of barter, which was brought from its original place of occurrence to the present Eastern States of the Union. A passage in Loskiel, who chiefly treats of the Delawares and Iroquois, refers to this trade. In describing the pipes of those Indians, he says: "Some are manufactured from a kind of red stone, which is sometimes brought for sale by Indians who live near the Marble river, on the western side of the Mississippi, where they extract it (*sic*) from a mountain."* This passage, it will be noticed, implies a direct trade-connection of great extent, the distance between the red pipestone quarry and the Northern Atlantic States being equal to twelve or thirteen hundred English miles.

SHELLS.

A substance pleasing to the eye, and easily worked, such as is offered by nature in the shells of marine and fresh-water mollusks, could not fail to attract the attention of men in the earliest times. The love of personal adornment, moreover, already manifests itself in the lowest stages of human development,† and shells being, above other natural productions, particularly fitted to be made into ornaments, it is not surprising that they were employed for that purpose in all parts of the world. The North American tribes made an extensive use of the shells of the sea-coast as well as of those of their rivers, and fossil marine shells were also employed as ornaments. The valves of recent marine mollusks, indeed, must have been widely circulated by barter, considering that they are found, in the shape of ornaments, and sometimes of utensils, in the interior of North America, at great distances from the shores of the sea. The oldest reference to the shell-trade among the aborigines is contained in the remarkable account of the Spaniard Alvar Nuñez Cabeça de Vaca, who accompanied in the year 1527, as treasurer and alguazil mayor, the unfortunate Pamphilo de Narvaez on

* Loskiel, Mission der evangelischen Brüder unter den Indianern in Nordamerika, Barby, 1789, p. 66.

† It is probable that the barbarous manufacturers of the rude flint tools found, associated with the bones of extinct animals, in the diluvial deposits of Northern France, used small round petrefacts of the chalk (*Coscinopora globularis*, D'Orb.) as beads, by stringing them together, these petrified bodies being provided by nature with holes passing through their middle (Lyell, Antiquity of Man, p. 119). Personal vanity is a prominent feature in the character of the North American Indians. Among the miserable Root-Diggers an old woman has been seen, who "had absolutely nothing on her person but a thread round her neck, from which was pendent a solitary bead." (Irving, Adventures of Captain Bonneville, p. 261.)

his expedition for the conquest of Florida. The leader and nearly all his followers having perished, Cabeça de Vaca, one of the survivors, wandered with his companions for many years through North America, until he finally succeeded in reaching the settlements of his countrymen near Culiacan, in the present Mexican province of Sinaloa, after having traversed the whole continent from the Floridian peninsula to the Pacific coast. The description of his adventures and sufferings forms one of the most remarkable early works on North America, being, indeed, the first that treats of the interior of the country and of its native population. For the latter reason it is of particular value to the ethnologist, presenting, as it does, the Indians as they were seen by the first white visitors.* While he sojourned among the Charruco Indians, a tribe inhabiting the coast, he carried on the business of a trader, which, as he observes, suited him very well, because it protected him at least from starvation. The excursions undertaken in the pursuit of his trade sometimes extended as far as forty or fifty leagues from the coast into the interior of the district. His wares consisted of pieces and "hearts" of sea-shells (*pedaços de caracoles de la mar y coraçones de ellos*), of shells employed by the Indians as cutting implements, and of a smaller kind that was used as money. These objects of trade he transported to parts distant from the sea, exchanging them there for other articles of which the coast-people were in want, such as hides, a red earth for painting their faces, stones for arrowheads, hard reeds for shafting the latter, and, finally, tufts of deer's hair dyed of a scarlet color, which were worn as head-dresses.† This passage, indeed, is of particular interest in connection with the subject treated in this essay, because it affords not only some insight into the system of Indian trade, but likewise informs us that among the objects of exchange those were conspicuous which served for the gratification of personal vanity. By the "hearts" of sea-shells Cabeça de Vaca understands the spines or *columnella* of large conchs, which parts were worked by the aborigines into a kind of ornament, of which more will be said hereafter.

Large quantities of shell-ornaments, mostly destined to be strung together or to be worn as pendants, have been found in the sepulchral mounds and other burial-places of the Indian race. In Ohio, according to Messrs. Squier and Davis, beads made of shell and other mate-

* The importance of Cabeça de Vaca's work, it seems to me, has been undervalued, perhaps on account of the marvelous cures which he pretends to have performed among the natives. Imbued with the superstitions of his time, he probably believed in his own powers of healing the sick in a supernatural way. When these incredible details are taken away, there remains much in the book that deserves the highest appreciation. According to Arthur Helps, a most careful investigator, his account "bears every mark of truthfulness." See: Helps, *The Spanish Conquest in America*, Harper's edition, Vol. IV, p. 397.

† *Relation et Naufrages d'Alvar Nuñez Cabeça de Vaca*, (Ternaux-Compans Collection), Paris, 1837, p. 121, &c. The Spanish original appeared in the year 1555 at Valladolid.

rials occur even more frequently in the sacrificial mounds than in those of a sepulchral character, a circumstance that may be accounted for by the value attached to these objects by their owners, who deemed them worthy of being offered in their sacrificial rites. The methods employed by the manufacturers doubtless being of the most primitive character, each shell-bead was the result of a certain amount of patient labor, and consequently was esteemed according to the time and art bestowed on its production.

The Indian shell-ornament in its simplest form consisted of entire specimens of small marine univalves, such as species of *Marginella*, *Natica*, and *Oliva*, which, after being conveniently pierced, could be strung together at once without further preparation, and worn as necklaces, armlets, &c. The above-mentioned kinds were met by Squier and Davis in the mounds of Ohio, and in opening the Grave Creek Mound five hundred specimens of *Marginella* were obtained near one of the skeletons. Some time ago, I received pierced specimens of *Marginella*, recovered in removing a mound at East St. Louis, in Southern Illinois, which, I believe, contained a great number of them. Small sea-shells appear to be particularly abundant in the Indian graves of the Gulf States. More than a hundred years ago, it was noticed by Carver that sea-shells were much worn by the Indians of the interior parts—he chiefly refers to the Dakotahs on the Upper Mississippi—and reckoned very ornamental. He could not learn how they procured them, but thought they were obtained by traffic with other nations nearer the sea.* Small fossil marine shells were sometimes used for the same purpose. In an article published in the Smithsonian Report for 1868, I have stated that a large number of such fossil shells were found, associated with agricultural flint implements, under the surface at East St. Louis, the place already mentioned.† They belonged almost exclusively to the genus *Conorulus* (*Melampus*), and many of them were prepared for stringing by a lateral perforation, as shown in the drawing (on p. 404) representing one of those shells. My knowledge, however, that the Indians used small fossil sea-shells as ornaments is not confined to the case in question, and I presume that many of the small marine shells taken from the mounds, which are considered as belonging to recent species, are, in reality, of fossil origin. Other fossil remains in a worked state, it may be mentioned in this connection, were obtained from the mounds of Ohio, as, for instance, shark's teeth, and others of considerable size, perhaps belonging to a cetaceous animal. The former are notched on both sides, or pierced at the lower end, and may have served, respectively, as amulets, arrowheads, or cutting implements.

Yet, the number of entire sea-shells employed as beads by the natives

* Carver, Travels, p. 151.

† Their fossil character was first pointed out to me by a competent conchologist, Mr. Thomas Bland, of Brooklyn.

appears insignificant when compared with the enormous quantity of objects of the same class, which they manufactured from fragments of the valves of marine and fluviatile shells. These wrought beads exhibit various forms and sizes, but, according to my experience, are mostly found in the shape of more or less regular sections of cylinders, pierced through the centre. They are often proportionately thick, but sometimes rather thin, resembling the small bone buttons of commerce. I have shell-beads from different parts of the United States. Most of them are small, not exceeding six or seven millimetres in diameter; my largest specimens, however, have a diameter of no less than twenty-eight millimetres. These latter, which were found, some time ago, with skeletons in the now leveled "Big Mound" at St. Louis, are very flat in proportion to their diameter, and may be called discs rather than beads. They are evidently made from the valves of species of *Unio* of the Mississippi valley. These and other shells, which abound in many rivers of the United States, frequently may have furnished the material for ornaments, especially in districts remote from the sea-coast. The holes of Indian shell-beads generally are drilled from both sides, and therefore mostly of a bi-conical shape.* The colored glass beads and enameled beads often found in Indian graves are, of course, of European origin, the art of making them being unknown to the aborigines, and their occurrence in Indian burial-places, therefore, indicates that the interment took place at a period when an intercourse with the whites already had been established. Of the so-called wampum-beads I shall speak at the close of this section.

The largest and therefore the most esteemed beads and pendants, however, were made by the Indians from the columellæ, or, as Cabeça de Vaca expresses it, from the "hearts," of large conchs, among which the *Strombus gigas* seems to have been most frequently used. These beads are more or less cylindrical, or globular, and always drilled lengthwise. Some are tapering at both ends, resembling a cigar in shape. I have seen specimens of two and one-half inches in length. The aborigines also made from the columellæ of large marine univalves peculiar pin-shaped articles, consisting of a more or less massive stem, which terminates in a round knob. Professor Wyman mentions, in the Third Annual Report on the Peabody Museum (1870), a specimen of this kind found in Tennessee, which is five inches long, with a head an inch in diameter. In the collection of Colonel Charles C. Jones, of Brooklyn, there are quite similar specimens of this class. Their destination is yet unex-

* Flat shell-beads are among the oldest antiquities of Europe. Lartet found them in the grotto of Aurignac, which served as a burial-place at a period, when the cave-bear, cave-hyena, mammoth, rhinoceros, &c., still existed. Some small flat beads in my possession, made of *Cardium*, which were obtained from a dolmen in Southern France, cannot be distinguished from similar productions of the North American Indians. Entire sea-shells (mostly *Litorina litorea*), pierced for stringing, occurred in the cave of Cro-Magnon, in the valley of the Vézère. Pierced valves of fossil sea-shells were found at other stations of the reindeer-period in the same valley, &c.

plained; they were perhaps attached to the head-dress, or worn as ornaments in some other way. The unwrought columellæ of large sea-shells have been found at considerable distances from the coast, as, for instance, in Ohio and Tennessee.

I have seen some very old Indian shell-ornaments, which were worn suspended from the neck, like medals or gorgets. They are round or oval plates, from two to four inches in diameter, on which various designs, sometimes quite tasteful, are engraved or *cut through*. In some instances their ornamentation consists in regularly disposed perforations.*

Very large sea-shells of the univalve kind, either in their natural state or more or less changed by art, frequently have been found in Indian burial-places and in localities generally, where the traces of Indian occupancy are met. Species of the *Pyrula* and *Cassis* occur most frequently. By the removal of the inner whorls and spines, and other modifications, these shells are sometimes prepared to serve as drinking-vessels and dishes. Professor Wyman speaks in the before-mentioned report of such vessels obtained from Tennessee and Florida, which are made from shells of the *Pyrula percersa*, Lam. One of the vessels measures a foot in length, though the pointed end is wanting. Dr. Troost gives the description and representation of a large, entirely hollowed *Cassis flammaea*, Lam., found in Tennessee, which served as the receptacle of a kneeling human figure of clay, to which he attributes the character of an idol.† I saw in the collection of Colonel Jones, of Brooklyn, a *Cassis*, likewise hollowed, which is eight inches and a half long, and has a diameter of seven inches, where its periphery is widest. This specimen is one of two which were found near Clarksville, Habersham County, Georgia, in one of those Indian stone-graves, which are met, sometimes many of them together, in various parts of the United States.‡

In the State of Ohio, where the former inhabitants have left the most conspicuous traces of their occupancy in the shape of numerous earth-

* "They oftentimes make, of this shell, a sort of gorge, which they wear about their neck in a string; so it hangs on their collar, whereon sometimes is engraven a cross, or some odd sort of figure, which comes next in their fancy. The gorges will sometimes sell for three or four buckskins ready dressed." Lawson, *History of Carolina*, London, 1714; reprint, Raleigh, 1860, p. 315. For drawings see Schoolcraft, Vol. I, plate 19, figure 3, and plate 25, figures 29 and 30; also, Morgan, *League of the Iroquois*, p. 389.

† Transactions of the American Ethnological Society, Vol. I, p. 361.

‡ The stone-grave in question contained a skeleton, much decayed, and, besides the two *Cassis*-shells, stone axes and chisels, some perforated objects of stone, &c. The most important piece, however, was a copper axe, which deserves particular mention. This axe is very long, but narrow and thin, and shows on both sides very distinctly the friction produced by having been inserted into the split end of a wooden handle. The objects found in this grave are all in the possession of Colonel Jones, who intends to publish an illustrated description of this find in his forthcoming work on the antiquities of Georgia.

works of various descriptions, and sometimes of stupendous extent, these large shells of marine mollusks are of frequent occurrence. Atwater already mentions them in the first volume of the *Archæologia Americana*, published in 1820. What Squier and Davis observed in regard to sea-shells generally during their investigations in Ohio, I will recapitulate here in a few words. They found in the mounds the smaller shells already specified, namely, *Marginella*, *Oliva*, and *Natica*, as well as entire specimens or fragments of *Cassis* and *Pyrula perversa*, and also the unwrought columellæ of a large species of conch, probably *Strombus gigas*. Entire specimens of the *Pyrula perversa*, they state, frequently have been discovered outside of the mounds, in excavating at different points in the Scioto valley. They found in one of the mounds a large *Cassis*, from which the inner whorls and columella had been removed, to adapt it for use as a vessel. This specimen, eleven inches and a half in length by twenty-four in circumference at the largest part, is now in the Blackmore Museum.*

The above-mentioned marine shells, all pertaining to tropical or semi-tropical regions, occur in the United States only on the eastern shore of the peninsula of Florida (perhaps a little higher northward) and on the coast of the Gulf of Mexico. From these localities, therefore, they must have found their way into the interior. Adopting, for example, Cape St. Blas, in the Mexican Gulf, and the centre of Ohio as the limits of shell-trade from south to north (an estimate probably much below reality), we find an intervening distance of nearly eight hundred English miles.

Having repeatedly alluded to large sea-shells prepared by the aborigines to serve as vessels, I will also mention that the Florida Indians, when first seen by Europeans, used such shells as drinking-cups. This we learn from the plates and descriptions contained in the "Brevis Narratio," of Jacques le Moyne de Morgues, in the second volume of DeBry's "Peregrinationes" (Francoforti ad Moenum, 1591). Plate 19 represents Indian widows who have cut off their hair in token of mourning, and scatter it over the graves of their husbands. On the graves are deposited bows and arrows, spears, and the large shells "out of which they drank."† The same shells may be seen on Plate 29, where warriors use them as drinking-cups. Plate 40, finally, illustrates the ceremonies which were performed at the death of a chieftain. The tumulus is already heaped up, and around its base arrows are stuck perpendicularly in the ground. The drinking-vessel of the deceased, a large shell, is placed on the top of the mound.‡ Though the shells are figured quite large in these plates, it is impossible to perceive to what species they

* Ancient Monuments, p. 283.

† The accompanying text runs thus: "*Ad maritorum sepulcra pervenientes, capillos sub auribus præsecant, illisque per sepulcra sparsis, maritorum arma & conchas ex quibus bibebant ibidem adjiciunt, in strenuorum virorum memoriam.*"

‡ In the text: "*Defuncto aliquo Rege ejus Provinciæ, magna solennitate sepelitur, & ejus tumulo crater, e quo bibere solebat, imponitur, defixis circa ipsum tumulum multis sagittis.*"

belong. Le Moyne drew his scenes of Indian life many years after his return from America, while living in England, and as he executed these delineations from memory, they are doubtless deficient in that minuteness of detail which entitles to safe comparisons and deductions.

Among some tribes of the interior marine shells seem to have been looked upon with a kind of religious reverence, and indications are not wanting that they played a part in their religious ceremonies. The peculiar sound produced by a sea-shell when approached to the ear necessarily appeared strange and mysterious to them, and the rareness of the shells, together with their elegant forms and beautiful colors, doubtless increased their value in the eyes of the natives. According to Long, the Omahas possessed, about half a century ago, a large shell (already transmitted from generation to generation) to which they paid an almost religious veneration. "A skin lodge or temple," says Long, "is appropriated for its preservation, in which a person constantly resides, charged with the care of it, and appointed its guard. It is placed upon a stand and is never suffered to touch the earth. It is concealed from the sight by several envelops, which are composed of strands of the proper skins, plaited and joined together in the form of a mat. The whole constitutes a parcel of considerable size, from which various articles are suspended, such as tobacco and roots of certain plants. No person dares to open all the coverings of this sacred deposit in order to expose the shell to view. Tradition informs them that curiosity induced three different persons to examine the mysterious shell, who were immediately punished for their profanation by instant and total loss of sight. The last of these offenders, whose name is Ish-ka-tappe, is still living. It was ten years since that he attempted so unveil the sacred shell, but, like his predecessors, he was visited with blindness, which still continues, and is attributed by the Indians, as well as by himself, to his committing of the forbidden act. This shell is taken with the band to all the national hunts, and is then transported on the back of a man. Previously to undertaking a national expedition against an enemy, the sacred shell is consulted as an oracle. For this purpose the magi of the band seat themselves around the great medicine lodge, the lower part of which is then thrown up like curtains and the exterior envelop is carefully removed from the mysterious parcel, that the shell may receive air. A portion of the tobacco, consecrated by being long suspended to the skin-mats or coverings of the shell, is now taken and distributed to the magi, who fill their pipes with it to smoke to the great medicine. During this ceremony an individual occasionally inclines his head forward and listens attentively to catch some sound which he expects to issue from the shell. At length, some one imagines that he hears a sound like that of a forced expiration of air from the lungs, or like the noise made by the report of a gun at a great distance. This is considered as a favorable omen, and the nation prepare for the projected expedition with a confidence of success. But, on the contrary, should no

sound be perceived, the issue of the expedition would be considered doubtful.* This shell, it cannot be doubted, was of marine origin, though the fact is not stated in the text. The nearest sea-coast from which it could have been obtained is that of the Mexican Gulf, distant about nine hundred miles from the district inhabited by the Omahas.

The white traders used to derive great profit by selling fine sea-shells to the tribes of the interior. Kohl, for instance, learned from Canadian fur-traders that the Ojibways, on Lake Superior, formerly purchased sea-shells from them at considerable prices. "When they (the traders) exhibited a fine large shell, and held it to the ears of the Indians, these latter were astonished, saying they heard the roaring of the ocean in it, and paid for such a marvelous shell furs to the value of thirty or forty dollars, and even more."†

Having undertaken to compose this essay for the purpose of bringing together a series of facts relating to the trade among the aborigines of North America, I would be guilty of an omission, if I neglected to mention the wampum-beads, which, besides other uses, represented the money among them. The term "wampum" is often applied to shell-beads in general, but should be confined, I think, to a certain class of cylindrical beads, usually one-fourth of an inch long and drilled lengthwise, which were chiefly manufactured from the shells of the common hard-shell clam (*Venus mercenaria*, Lin). This bivalve occurring, as every one knows, in great abundance on the North American coasts, formed an important article of food of the Indians living near the sea, a fact demonstrated by the enormous quantity of castaway clam-shells, which form a considerable part of North American *Kjoekkenmoeddings*. The natives used to string the mollusks and to dry them for consumption during winter. The blue or violet portions of the clam-shells furnished the material for the dark wampum, which was held in much higher estimation than that made of the white part of the shells, or of the spines of certain univales. Even at the present time places are pointed out on the Atlantic sea-board, for example on that of Long Island, where the Indians manufactured wampum, and such localities may be recognized by the accumulations of clam-shells from which the blue portions are broken off.

Wampum-beads formed a favorite material for the manufacture of necklaces, bracelets, and other articles of ornament, and they constituted the strings and belts of wampum, which played such a conspicuous part in Indian history.

Loskiel makes the following statement in reference to wampum: "Before North America was discovered by the Europeans, the Indians mostly made their strings and belts of small pieces of wood, cut to an equal size and dyed white and black. They made some of shells, which

* Long, Expedition from Pittsburgh to the Rocky Mountains, performed in the years 1819 and 1820, London, 1823, Vol. II, p. 47, &c.

† Kohl, Kitschi-Gami, Vol. I, p. 186.

they highly esteemed, but they manufactured them very rarely, because this labor required much time for want of the proper tools; and the beads, moreover, were of a rude and clumsy appearance. Soon after their arrival in America, the Europeans began to manufacture wampum from shells, very neatly and in abundance, exchanging it to the Indians for other commodities, thus carrying on a very profitable trade. The Indians now abandoned their wooden belts and strings, and substituted those of shell. The latter, of course, gradually declined in value, but, nevertheless, were and still are much prized.*

I have little faith in Loskiel's statement that the Indians chiefly used wood for the above-mentioned purpose, before they had intercourse with the whites. Loskiel never visited America; he composed, as he observes in the preface, his work from the journals and reports of Protestant missionaries, and probably was totally unacquainted with the early writings relating to North America, in which wampum is mentioned. Roger Williams, for example, who emigrated to North America in 1631, is quite explicit on that point. He states that the Indians manufactured white and dark wampum-beads, and that six of the former and three of the latter were equivalent to an English penny. Yet it appears that even at his time the colonists imitated the wampum, and used it in their trade with the natives. "The Indians," he says, "bring downe all their sorts of Furs, which they take in the countrey, both to the Indians and to the English for this Indian Money: this Money the English, French, and Dutch, trade to the Indians, six hundred miles in severall parts (North and South from New-England) for their Furses, and whatsoever they stand in need of from them: as Corne, Venison, &c."† Similar statements are contained in the writings and records of various persons who lived in North America contemporaneously with the liberal-minded founder of Rhode Island. Even in the intercourse of the English colonists among themselves, wampum served at certain periods instead of the common currency, and the courts of New England issued from time to time regulations for fixing the money-value of the wampum. In transactions of some importance it was measured by the fathom, the dark or blue kind generally being double the value of the white.‡ According to Roger Williams, the Indians of New England—he chiefly refers to the Narragansetts—denoted by the term *wompam* (which signifies *white*) the white beads, while they called the dark kind *suckauhock* (from *sácki*, *black*).§ The great value attached to wampum as an ornament is well illustrated by the following passage from the same author: "They hang these strings of money about their necks and wrists; as also upon

* Loskiel, *Mission der evangelischen Brüder*, &c., p. 34.

† Roger Williams, *A Key*, &c., p. 128.

‡ Interesting details concerning wampum are given by Mr. Stevens in "Flint Chips," London, 1870, pp. 454-64.

§ Roger Williams, l. c. p. 130. In another place (p. 154) he gives the word *wómpi* for *white*. *Wampumpeage*, *peak*, *seawant*, *roanok*, were other names to signify wampum.

the necks and wrists of their wives and children. *Máchequoce*, a Girdle; which they make curiously of one, two, three, four, and five inches thickness and more, of this money which (sometimes to the value of ten pounds and more) they wear about their middle and as a scarf about their shoulders and breasts. Yea, the Princes make rich Caps and Aprons (or small breeches) of these Beads thus curiously strung into many formes and figures: their blacke and white finely mixt together.*

The wampum-belts, so often mentioned in connection with the history of the eastern tribes, consisted of broad straps of leather, upon which white and blue wampum-beads were sewed in rows, being so arranged that by the contrast of the light and dark colors certain figures were produced. The Indians, it is well known, exchanged these belts at the conclusion of peace, and on other solemn occasions, in order to ratify the transaction and to perpetuate the remembrance of the event. When sharp admonitions or threatening demonstrations were deemed necessary, the wampum-belts likewise played a part, and they were even sent as challenges of war. In these various cases the arrangement of the colors and figures of the belts corresponded to the object in view: on peaceable occasions the white color predominated; if the complications were of a serious character, the dark prevailed; and in the case of a declaration of war, it is stated, the belt was entirely of a somber hue, and, moreover, covered with red paint, while there appeared in the middle the figure of a hatchet executed in white. The old accounts, however, are not quite accordant concerning these details, probably because the different Atlantic tribes followed in this particular their own taste rather than a general rule. At any rate, however, the wampum-belts were considered as objects of importance, being, as has been stated, the tokens by which the memory of remarkable events was transmitted to posterity. They were employed somewhat in the manner of the Peruvian *quipu*, which they also resembled in that particular, that their meaning could not be conveyed without oral comment. At certain times the belts were exhibited, and their relations to former occurrences explained. This was done by the aged and experienced of the tribe, in the presence of young men, who made themselves thoroughly acquainted with the shape, size, and marks of the belts as well as with the events they were destined to commemorate, in order to be able to transmit these details to others at a future time. Thus the wampum-belts represented the archives of polished nations. Among the Iroquois tribes, who formed the celebrated "league," there was a special "keeper of the wampum," whose duty it was to preserve the belts and to interpret their meaning, when required. This office, which bore some resemblance to that of the quipu-decipherer (*quipu-camayoc*) of the Peruvians, was intrusted to a sachem of the Onondagas.†

In March, 1864, a delegation of Iroquois of the State of New York

* Ibid., p. 131.

† Morgan, League of the Iroquois, p. 121.

passed through New York City on their way to Washington, where they intended to negotiate with the Government concerning former treaties relative to their lands. They had brought with them their old wampum-belts, as documents to prove the justness of their claims. One of these belts, if I am not mistaken, had been given them by General Washington on some important occasion; for even the whites of that period were under the necessity of conforming to the established rule in their transactions with the natives. The New York Historical Society honored these delegates with a public reception, which ceremony took place in the large hall of the Society. The president delivered the speech of welcome, which an old chief, unable to express himself in English, answered in the Seneca dialect. A younger chief, Dr. Peter Wilson, called by the people of his tribe *De-jih-non-da-weh-hoh*, or the "Pacifcator," served as interpreter, being well versed in both languages. He afterward exhibited the belts, and explained their significance. They were, as far as I can recollect, about two feet long and of a hand's breadth. The ground consisted of white beads, while blue ones formed the figures or marks. The latter resembled ornamental designs, and I could not discover in them the form of any known object. I compared them at the time to somewhat roughly executed embroideries of simple patterns. I asked the "Pacifcator" whether these belts were the work of Indians or of whites; but he was unable to give me any definite information on that point.*

I possess a number of white and blue wampum-beads from an Indian grave, opened in 1861, near Charlestown, in the State of Rhode Island. The late Dr. Usher Parsons, of Providence, Rhode Island, to whom I am indebted for these beads, has described the grave,† and thinks it enclosed the remains of a daughter of Ninigret, Sachem of the Niantic or Nahantic tribe of Indians. The interment is supposed to have taken place about the year 1660. These beads are regularly worked cylinders, drilled lengthwise, and from five to nine millimetres in length, by four or five in diameter. Of course, it cannot now be decided whether Indians or whites were their manufacturers. The grave contained many other objects, but almost without exception derived from the colonists of that period. I may also state, in this place, that thus far I have not found in the oldest English works on North America a perfectly satisfactory account of the method originally employed by the Indians in the manufacture, and especially in the drilling, of the wampum-beads.‡

Among the tribes of the northwestern coast of North America, from

* This is the same chief who delivered, in 1847, before the New York Historical Society, a powerful speech, quoted by Morgan, (League of the Iroquois, p. 440). The chief's name was then *Wā-o-wo-wā-nō-onk*.

† New York Historical Magazine, February, 1863:

‡ "Before ever they had awle blades from Europe, they made shift to bore this their shell money, with stones, and to fell their trees with stone set in a wooden staff, and used wooden hoes; which some old and poore women (fearfull to leave the old tradition) use to this day."—Roger Williams, *Key*, p. 130.

the northern border of California far upward to the north, the shells of the *Dentalium* represented, until within the latest time, the wampum of the Atlantic region, being used, like the latter, both as ornament and money. These shells, which abound in certain places of the Pacific coast, may be likened to small, tapering, and somewhat curved tubes. Being open at both ends, they can be strung without further preparation. As my essay relates only to that portion of North America which lies east of the Rocky Mountains, I probably would not have mentioned the use of *Dentalium*-shells, were it not for the fact that they have been found in the interior of the country, far from the Pacific coast, as personal ornament of existing tribes, and even in the ancient mounds of Ohio.* The latter fact, indeed, is of great interest in its bearing on the extent of former aboriginal trade-relations, the distance from the Pacific to the State of Ohio being almost equal to the whole breadth of the North American continent.†

PEARLS.

Perforated pearls, destined to serve as beads, often form a part of the contents of ancient North American mounds. Squier and Davis found them on the hearths of five distinct groups of mounds in Ohio, and sometimes in such abundance that they could be gathered by the hundred. Most of them had greatly suffered by the action of fire, being in many cases so calcined that they crumbled when handled; yet, several hundred were found sufficiently well preserved to permit of their being strung. The pearls in question are generally of irregular form, mostly pear-shaped, though perfectly round ones are also among them. The smaller specimens measure about one-fourth of an inch in diameter, but the largest has a diameter of no less than three-fourths of an inch.‡ According to Squier and Davis, pearl-bearing shells occur in the rivers of the region whose antiquities they describe, but not in such abundance that they could have furnished the amount discovered in the tumuli; and the pearls of these fluviatile shells, moreover, are said to be far inferior in size to those recovered from the altars. The latter, they think, were derived from the Atlantic coast and from that of the Mexican Gulf. It is a fact that the Indians, who inhabited the present Southern States of the Union, made an extensive use of pearls for ornamental purposes. This is attested by the earliest accounts, and more especially by the chroniclers of De Soto's expedition (the anonymous Portuguese gentleman and Garcilasso de la Vega), who speak of almost fabulous quantities of pearls, which that daring leader and his followers

* Stevens, *Flint Chips*, p. 468.

† Since writing the above, I learned, by consulting Woodward's work on conchology, that the *Dentalium* is also found in the West Indies. If it should likewise occur on the southern coasts of the United States, there is at least a possibility that the specimens found in Ohio may have been obtained from the last-named region.

‡ *Ancient Monuments*, p. 232

saw among the Indians of the parts traversed by them. Pearls, however, belonged to the things most desired by the Spaniards, and the accounts relating to them, perhaps, may be somewhat exaggerated. The following passage from Garcilasso de la Vega is of particular interest:

"While De Soto sojourned in the province of Ichiaha,* the cacique visited him one day, and gave him a string of pearls about two fathoms (*deux brasses*) long. This present might have been considered a valuable one, if the pearls had not been pierced; for they were all of equal size and as large as hazle-nuts.† Soto acknowledged this favor by presenting the Indian with some pieces of velvet and cloth, which were highly appreciated by the latter. He then asked him concerning the pearl-fishing, upon which he replied that this was done in his province. A great number of pearls were stored in the temple of the town of Ichiaha, where his ancestors were buried, and he might take as many of them as he pleased. The general expressed his obligation, but observed that he would take away nothing from the temple, and that he had accepted his present only to please him. He wished to learn, however, in what manner the pearls were extracted from the shells. The cacique replied that he would send out people to fish for pearls all night, and on the following day at eight o'clock (*sic*) his wish should be gratified. He ordered at once four boats to be dispatched for pearl-fishing, which should be back in the morning. In the meantime much wood was burned on the bank, producing a large quantity of glowing coals. When the boats had returned, the shells were placed on the hot coals, and they opened in consequence of the heat. In the very first, ten or twelve pearls of the size of a pea were found, and handed to the cacique and the general, who were present. They thought them very fine, though the fire had partly deprived them of their lustre. When the general had satisfied his curiosity, he retired to take his dinner. While thus engaged, a soldier came in, who told him that in eating some of the oysters caught by the Indians, a very fine and brilliant pearl had got between his teeth, and he begged him to accept it as a present for the governess of Cuba.‡ Soto very civilly refused the present, but assured the soldier that he was just as much obliged to him as though he had accepted his gift: he would try to reward him one day for his kindness and for the regard he was showing to his wife. He advised him to keep his (intended) present, and to buy horses for it at Havana. The Spaniards, who were with the general at that moment, examined the pearl of this soldier, and some, who considered themselves as experts in the matter of jewelry, thought it was worth four hundred ducats. It had re-

* The province and town of Iciaha, or Ichiala, have been located in that part of Northern Georgia where the Oostanaula and Etowah rivers unite, and form the Coosa river. (See Theodore Irving's "Conquest of Florida," second edition, p. 242; also McCulloh's "Researches," p. 525.)

† The Indians used to pierce them with a heated copper wire, a process by which they were spoiled.

‡ Doña Isabel de Bobadilla, De Soto's wife.

tained its original lustre, not having been extracted by means of fire.*

It is evident, therefore, that the Indians obtained their pearls, in part at least, from their river-muscles, many of which are known to be margaritiferous.† These mollusks undoubtedly were used as food by the aborigines, who ate alligators, snakes, and other animals less tempting than the contents of fluviatile shells. Indeed, I learned from Dr. Brinton, who was attached to the Army of the Cumberland during the late civil war, that muscles of the Tennessee river were occasionally eaten "as a change" by the soldiers of that corps, and pronounced no bad article of diet. Shells of the *Unio* are sometimes found in Indian graves, where they had been deposited with the dead, to serve as food during the journey to the land of spirits. In many parts of the North American inland heaps of fresh-water shells are seen, indicating the places where the natives feasted upon the mollusks. Atwater has drawn attention to such accumulations on the banks of the Muskingum, in Ohio.‡ Heaps of muscle-shells may be seen in Alabama, along the rivers wherever Indians used to live. Thousands of the shells lie banked up, some deep in the ground.§ Dr. Brinton saw on the Tennessee river and its tributaries numerous shell-heaps, consisting almost exclusively of the *Unio virginianus* (Lamarck?). In all instances he found the shell-heaps close to the water-courses, on the rich alluvial bottom-lands. "The mollusks," he says, "had evidently been opened by placing them on a fire. The Tennessee muscle is margaritiferous, and there is no doubt but that it was from this species that the early tribes obtained the hoards of pearls which the historians of De Soto's exploration estimated by bushels, and which were so much prized as ornaments. It is still a profitable employment, the jewelers buying them at prices varying from one to fifty dollars."|| *Kjoekkenmoeddings* on the St. John's river, in Florida, consisting of river-shells, were examined by Professor Wyman, and described by him; he saw similar accumulations on the banks of the Concord river in Massachusetts, and was informed by eye-witnesses that they are numerous in California.¶ On Stalling's Island, in the Savannah river, more than two hundred miles above its mouth, there stands a mound of elliptical shape, chiefly composed of the muscles, clams, and snail-shells of the river. This tumu-

* Garcilasso de la Vega, *Conquête de la Floride*, Vol. II, p. 296.

† As Mr. Isaac Lea, of Philadelphia, informs me, pearls are found in various species of the *Unionida*, more frequently in *Unio complanatus*, *Margaritana margaritifera*, and *Anodonta fluviatilis*. But they occur occasionally in all the species of this family. Very large and valuable pearls have been found in New Jersey.

‡ *Archæologia Americana*, Vol. i, p. 226.

§ Pickett, *History of Alabama*, Charleston, 1851, Vol. I p. 12.

|| Brinton, *Artificial Shell-Deposits in the United States*, Smithsonian Report for 1866, p. 357.

¶ Wyman, *Fresh-Water Shell-Heaps of the St. John's River, East Florida*, Salem, Massachusetts, 1868, p. 6.

lus, which is about three hundred feet long, one hundred and twenty feet wide, and, perhaps, over twenty feet high, was found to contain a large number of skeletons. "Several pits have been opened in the northeastern end. At the depth of twelve feet the amount of shells was undiminished. They appear to have been distributed in layers of eight or ten inches in thickness, with intervening strata of sand. An examination into the contents of the mound proves conclusively that it must have been used only for burial purposes; that it is, in fact, a huge necropolis. It could not have been the work of a year, or of a generation. Stratum upon stratum has been heaped, each covering the dead of its age, until by degrees, and with the lapse of time, it grew into its present surprising dimensions."*

It is probable that the natives of North America obtained pearls, both from fluviatile and marine shells, and further that they caught the bivalves, not solely on account of the pearls they inclosed, but for using them as food. The pearls themselves, in all likelihood, were looked upon as additional, highly valued gifts of nature.

DIVISION OF LABOR.

Among the later Indians, at least those who lived east of the Rocky Mountains, nearly all work was performed by women. When, during times of peace, the master of a lodge had supplied his family with the game necessary for its support, he thought to be relieved of further duties, and abandoned himself either to indolence or to his favorite pastimes, such as games of hazard, and exercises calculated to impart strength and agility to the body. He manufactured, however, his arms and kept them in repair, and also condescended to work, when a larger object, a canoe for instance, was to be made, or a dwelling to be constructed. Far more varied, on the other hand, were the duties imposed upon women. Not only had they to procure water and fire-wood, to prepare the meals, to collect the fruits serving as winter-provisions, to make moccasins and other articles of dress, but it was also incumbent upon them to perform many other labors, which, from their nature, would seem to be more suited for men. Thus, the fields were cultivated by women;† they dressed the skins to fit them for garments and other purposes; the manufacture of pottery was a branch of female industry; they did the principal work in the erection of the huts or tents (of skins, mats or bark), and their assistance was even required when canoes, especially those of bark, were made. During the march they carried heavy loads, and on the water they handled the paddle as skilfully as the men. If to all those tasks and toils the bringing up of children is added, the lot of the Indian woman appears by no means an enviable one, though she bore her burden patiently, not being accustomed to a different manner of existence. She was, indeed, hardly more than the servant of her lord

* Jones (Charles C.), *Monumental Remains of Georgia*, Savannah, 1861, p. 14.

† Also, to some extent, by enslaved prisoners of war.

and master, who frequently lived in a state of polygamy merely for commanding more assistance in his domestic affairs.

Such were the occupations of Indian men and women *in general*. Nevertheless, there are indications that the germs of handicrafts already existed among the North American tribes, or, to speak more distinctly, that certain individuals of the male sex, who were, by natural inclination or practice, particularly qualified for a distinct kind of manual labor, devoted themselves principally or entirely to this labor. I refer, of course, to the period anteceding the occupation of the country by Europeans—that period about which so little is known, that a careful examination of the still existing earth-works, and of the minor products of industry left by the former inhabitants, affords the principal guidance in the attempt to determine their mode of existence. The earliest writings on North America are exceedingly deficient in those details which are of interest to the archæologist, and form, as it were, his points of departure; and it becomes therefore necessary to adopt here, in the pursuit of archæological investigation, the same system of careful inquiry and deduction that has been so successfully employed in Europe. The only difference is, that in the latter part of the world “prehistoric times” reach back thousands of years into the remotest antiquity, while in America a comparatively recent period must be drawn within the precinct of antiquarian research.

Any one who examines a collection of North American chipped flint implements will notice quite rude and clumsy specimens, but also, alongside of these, others of great regularity and exquisite finish, which could only have been fashioned by practised workers in flint. This applies particularly to the points of arrows and lances, some of which are so sharp and pointed that they, when properly shafted, almost would be as effectual as iron ones. In fact, the oldest Spanish writings contain marvelous accounts of the penetrating force of the flint-pointed arrows used by the Indians of Florida in their encounters with the whites. Not every warrior, it may be presumed, was able to make stone-points, especially those of a superior kind, this labor requiring a skill that could only be attained by long practice. There were doubtless certain persons among the various tribes who practised arrow-making as a profession, and disposed of their manufactures by way of exchange. In reference to this subject Mr. Schoolcraft observes as follows: “A hunter, or warrior, it is true, expected to make his own arms or implements, yet the manufacture of flint and hornstone into darts and spears and arrowheads demanded too much skill and mechanical dexterity for the generality of the Indians to succeed in. According to the Ojibway tradition, before the introduction of fire-arms, there was a class of men among the northern tribes who were called *makers of arrowheads*. They selected proper stones, and devoted themselves to this art, taking in exchange for their manufactures, the skins and flesh of animals.” According to Colonel Jones, the tradition has been preserved in Georgia “that among the Indians who inhabited

the mountains, there was a certain number or class who devoted their time and attention to the manufacture of these darts. That as soon as they had prepared a general supply, they left their mountain homes and visited the sea-board and intermediate localities, exchanging their spear and arrowheads for other articles not to be readily obtained in the region where they inhabited. The further fact is stated that these persons never mingled in the excitements of war; that to them a free passport was at all times granted, even among tribes actually at variance with that of which they were members; that their avocation was esteemed honorable, and they themselves treated with universal hospitality. If such was the case, it was surely a remarkable and interesting recognition of the claims of the manufacturer by an untutored race.*

In a former section I have mentioned a Californian Indian of the Shasta tribe, who was seen making arrowheads of obsidian by Mr. Caleb Lyon. "The Indian," he says, "seated himself on the floor, and, placing a stone anvil upon his knee, which was of compact talcose slate, with one blow of his agate chisel he separated the obsidian pebble into two parts, then giving another blow to the fractured side he split off a slab a fourth of an inch in thickness. Holding the piece against the anvil with the thumb and finger of his left hand, he commenced a series of continuous blows, every one of which chipped off fragments of the brittle substance. It gradually assumed the required shape. After finishing the base of the arrowhead (the whole being only a little over an inch in length) he began striking gentler blows, every one of which I expected would break it into pieces. Yet such was their adroit application, his skill and dexterity, that in little over an hour he produced a perfect obsidian arrowhead. *Among them arrow-making is a distinct trade or profession, which many attempt, but in which few attain excellence.*"†

Another method of arrow-making practised by the Californian tribes is mentioned by Mr. Edward E. Chever in an article published in the "American Naturalist," May, 1870. He has figured the implement used in the process (p. 139). "The arrow-head," he says, "is held in the left hand while the nick in the side of the tool is used as a nipper to chip off small fragments."

Mr. Catlin gives an interesting and full account of the manufacture of arrowheads among the Apaches and other tribes living west of or in the Rocky Mountains. The following extract contains his principal statements: "Erratic boulders of flint are collected (and sometimes brought an immense distance) and broken with a sort of sledge-hammer made of a rounded pebble of hornstone, set in a twisted withe, holding the stone and forming a handle. The flint, at the indiscriminate blows of the sledge, is broken into a hundred pieces. The master-workman, seated on the ground, lays one of these flakes on the palm of his left hand,

* Jones (Charles C.), Indian Remains in Southern Georgia. Address delivered before the Georgia Historical Society, Savannah, 1859, p. 19.

† Bulletin of the American Ethnological Society, New York, 1861, Vol. I, p. 39.

holding it firmly down with two or more fingers of the same hand, and with his right hand, between the thumb and two forefingers places his chisel or punch* on the point that is to be broken off; and a co-operator (a striker) sitting in front of him, with a mallet of very hard wood, strikes the chisel on the upper end, flaking the flint off on the under side, below each projecting point that is struck. The flint is then turned and chipped in the same manner from the opposite side; and so turned and chipped until the required shape and dimensions are obtained, all fractures being made on the palm of the hand, whose yielding elasticity enables the chip to come off without breaking the body of the flint, which would be the case if they were broken on a hard substance. This operation is very curious, both the holder and the striker singing, and the strokes of the mallet given exactly in time with the music, and with a sharp and *rebounding* blow, in which, the Indians tell us, is the great *medicine* (or mystery) of the operation. Every tribe has its *factory* in which these arrowheads are made, and in those *only certain adepts are able or allowed to make them for the use of the tribe.*"†

Thus tradition as well as modern experience justify the belief that the manufacture of arrow and spearheads was formerly carried on as a craft by certain individuals of the North American tribes, and Longfellow's "Ancient Arrow-maker," therefore, is not a mythical person, but the ideal type of a class of men whose art flourished in by-gone times.

The skilfully executed agricultural flint implements of East St. Louis, described by me in the Smithsonian Report for 1868, have altogether the appearance as if *one* hand had fashioned them. Is it not probable that they formed the magazine of an aboriginal artisan, who devoted his time chiefly to the manufacture of such tools? The making of wampum and of shell-beads in general may have formed a trade among the tribes inhabiting the sea-board; for this labor required much time and promised success only to those who, by long practice, had attained skill in the operation. The supposition gains some ground by an observation of Roger Williams, who states that "most on the Sea side make Money and Store up shells in Summer against Winter whereof to make their money." He further observes on the same page: "They have some who follow onely making of Bowes, some Arrowes, some Dishes (and the women make all their Earthen Vessells,) some follow fishing, some hunting."‡

The most remarkable productions of ancient aboriginal industry are the carved stone pipes of peculiar shape exhumed by Messrs. Squier and Davis from the mounds of Ohio, and minutely described and figured by them in the "Ancient Monuments of the Mississippi Valley.§"

* Six or seven inches in length, and made of an incisor of the sperm-whale, often stranded on the coast of the Pacific.

† Catlin, *Last Rambles amongst the Indians*, New York, 1867, p. 187, &c.

‡ Roger Williams, *A Key*, &c., p. 133.

§ Chapter XV, *Sculptures from the Mounds*, pp. 242-278.

Four miles north of Chillicothe, Ohio, there lies, close to the Scioto river, an embankment of earth somewhat in the shape of a square with strongly rounded angles, and enclosing an area of thirteen acres, over which twenty-three mounds are scattered without much regularity. This work has been called "Mound City," from the great number of mounds within its walls. In digging into the mounds, Squier and Davis discovered hearths in many of them, which furnished a great number of aboriginal relics. From one of the hearths nearly two hundred of those peculiar stone pipes were taken, many of them, unfortunately, cracked by the action of the fire, and otherwise damaged. The occurrence of these "mound-pipes," however, was not confined to the mound in question, similar ones having occasionally been found elsewhere. In the more elaborate pipes from Mound City, the bowl is sometimes formed in imitation of the human head, but generally of the body of an animal, and in the latter cases the peculiar characteristics of the species which have served as models are frequently expressed with surprising fidelity. The following mammals have been recognized: the beaver, otter, elk, bear, wolf, dog, panther, wild cat, raccoon, opossum, squirrel, and sea-cow (Manati, Lamantin, *Trichecus manatus*, Lin.). Of the last-named animal, no less than seven representations were found, a circumstance deserving particular notice, because this inhabitant of tropical waters is not met in the higher latitudes of North America, but only on the coast of Florida, which is many hundred miles distant from Ohio. The Florida Indians called this animal the "big beaver," and hunted it on account of its flesh and bones.* Most frequent are carvings of birds, among which the eagle, hawk, falcon, turkey-buzzard, heron, several species of owls, the raven, swallow, parouquet, duck, and other land and water-birds, have been recognized. One of the specimens is supposed to represent the toucan, a tropical bird not inhabiting the United States. Worthy of particular mention as a well-executed sculpture is a species of eagle or hawk in the attitude of tearing a smaller bird held in its claws; and so is that of the tufted heron feeding on a fish. The amphibious animals, likewise, have their representatives in the snake, toad, frog, turtle, and alligator. One specimen shows a snake that winds itself around the bowl of the pipe. The toads, in particular, are very faithful imitations of nature. Indeed, it is said in the "Ancient Monuments" that, if placed in the grass before an unsuspecting observer, they would probably be mistaken for the natural objects; and this statement is in no way exaggerated, as every one will admit who has seen the specimens in question. The bird-figure supposed to represent the toucan, I think, is not of sufficient distinctness to identify the original that was before the artist's mind; it would not be safe, therefore, to make this specimen the subject of far-reaching speculations. For the rest, the imitated animals belong, with-

* Bartram, Travels, Dublin, 1793, p. 229.

out exception, to the North American fauna; and there is, moreover, the greatest probability that the sculptures in question were made in or near the present State of Ohio, where, in corroboration of the last supposition, a few unfinished specimens have occurred among the complete articles. The discovery of the manati-figures, however, is in so far of interest as it indicates a communication between the ancient inhabitants of Ohio and those of the Floridian coast-region.

It was formerly believed most of these pipes were composed of a kind of porphyry; but since their transfer to the Blackmore Museum, they were carefully examined and partly analysed by Professor A. H. Church, who found them to consist of softer materials.* Nevertheless, they constitute the most remarkable class of Indian products of art thus far discovered, for some of them are so skilfully executed that a modern artist, notwithstanding his far superior instruments, would find no little difficulty in reproducing them. The manufacture of stone pipes, necessarily a painful and tedious labor, therefore may have formed a branch of aboriginal industry, and the skilful pipe-carver probably occupied among the former Indians a rank equal to that of the experienced sculptor in our time. Even among modern Indians pipe-makers sometimes have been met. Thus, Dr. Wilson mentions an old Ojibway Indian, whose name is *Pabahmesad*, or the "Flier," but who, from his skill in making pipes, is more commonly known as *Pwahguneka*—"he makes pipes."† Kohl, also, speaks of an Ojibway pipe-maker whom he met on Lake Superior. "There are persons among them," he says, "who possess particular skill in the carving of pipes, and make it their profession, or at least the means of gaining in part their livelihood. I made the acquaintance of such a *faiseur de calumet*, and visited him occasionally. He inlaid his pipes very tastefully with figures of stars and flowers of black and white stones. But his work proceeded very slowly, and he sold his pipes at high prices, from four to five dollars apiece. Yet the Indians sometimes pay much higher prices."‡

In addition to the articles thus far enumerated, others may have been manufactured more or less extensively by way of trade; but, in default of corroborating data, we must rest satisfied with the supposition that such was the case. European archæologists, in estimating the conditions of prehistoric races of the Old World, have derived much aid from inquiries into the modes of life among still-existing primitive populations of foreign parts. The same system may be applied in antiquarian researches relative to North America, where the customs and manners of the yet lingering aboriginal population can be brought into requisition for elucidating the past. Thus, some statements made by Mr. James G. Swan, in a recent work on the Makah Indians of Cape Flattery, (published by the Smithsonian Institute,) are of great interest in

* Church, in "Flint Chips," p. 414.

† Wilson, *Prehistoric Man*, Lond., 1862, Vol. II, p. 15.

‡ Kohl, *Kitschi-Gami*, Vol. II, p. 82.

connection with the object treated in this article. "The manufacture of implements," he says, "is practised by all; some, however, producing neater articles, are more employed in this way. The manufacture of whaling implements, particularly the staff of the harpoon and the harpoon-head, is confined to individuals who dispose of them to the others. This is also the case with rope-making; although all understand the process, some are peculiarly expert, and generally do the most of the work. Canoe-making is another branch that is confined to certain persons who have more skill than others in forming the model and in finishing the work. Although they do not seem to have regular trades in these manufactures, yet the most expert principally confine themselves to certain branches. Some are quite skilful in working iron and copper, others in carving or in painting, while others again are more expert in catching fish or killing whales."*

It is true, the conditions of existence of a northern tribe bordering on the Pacific coast cannot serve as a standard for the populations formerly inhabiting the valleys of the Mississippi and Ohio, or the Atlantic sea-board; yet, that the latter were led by similar motives, in regard to the division of labor, seems to be confirmed by the observations and extracts given in this sketch.

CONCLUSION.

In the preceding series of articles I have almost exclusively referred to *manufactures*, and among these, of course, only to such as could, from their nature, resist the destroying influence of time. Yet, it cannot be doubted that articles consisting of less durable materials, for instance, dressed skins, basket-work, mats, wooden ware, &c., formed objects of traffic. The most extensive exchange, perhaps, was carried on in provisions that could be preserved, such as dried or *buccaned* meat, maize, maple-sugar, and other animal or vegetable substances. Those who were abundantly provided with one or the other article of food bartered it to their less favored neighbors, who, in return, paid them in superfluous products or in manufactures of their own. Concerning the ways of communication, the North American continent afforded, by its many navigable waters, rivers as well as lakes, perhaps greater facilities for a primitive commerce than any other part of the earth, and the canoe was the means of conveyance for carrying on this commerce.

The learned Jesuit, Lafitau, has given some account of Indian trade as it was in the beginning of the eighteenth century, at which period he lived, as a missionary, in North America. "The savage nations," he says, "always trade among each other. Their commerce is, like that of the ancients, a simple exchange of wares against wares. They all have something particular which the others have not, and the traffic

*Swan, The Indians of Cape Flattery, at the Entrance to the Strait of Fuca, Washington Territory, Washington, 1870, p. 48.

makes these things circulate among them. Their wares are grain, porcelain (wampum), furs, robes, tobacco, mats, canoes, work made of moose or buffalo hair and of porcupine quills, cotton-beds, domestic utensils—in a word, all sorts of necessities of life required by them.* A passage from Lawson, a contemporary of Lafitau, may also be inserted with propriety in this place. Speaking of the natives of Carolina, he says: "The women make baskets and mats to lie upon, and those that are not extraordinary hunters make bowls, dishes, and spoons of gum-wood and the tulip-tree; others, where they find a vein of white clay fit for their purpose, make tobacco-pipes, all which are often transported to other Indians that, perhaps, have greater plenty of deer and other game, &c.†"

The arrival of the whites produced a thorough change in Indian life, wherever a contact between the two races took place. The age of stone and that of iron met, almost without an intervening link, for the so-called North American "copper period" was but of little practical significance. Simultaneously with the settlement of the eastern parts of North America by the whites, there arose a traffic between these and the Indians in their neighborhood, which provided the latter with implements and utensils so far superior to their own, that they soon ceased to manufacture and use them. The keen-edged steel axe superseded the clumsy and far less serviceable stone tomahawk; the European knife did away with the cutting implement of flint; and those of the natives who could not obtain fire-arms at least headed their arrows with points of iron or brass. The potter's art was neglected, solid and durable vessels of metal supplying the place of the fragile aboriginal fabrics of clay. Instead of procuring fire by turning a wooden stick, fitting in a small cavity of another piece of wood, rapidly between their hands until ignition was effected, the natives now resorted to the far preferable method of striking fire with steel and flint. Their dress, too, underwent changes, pliant woolen and cotton textures being employed to a certain extent instead of dressed skins. Formerly, when the Indians wished to make one of their more durable canoes or a large mortar for pounding maize, they had first to fell a suitable tree, a task which, on account of the insufficiency of their tools, required much labor and time. Being unable to cut down a tree with their stone axes, they resorted to fire, burning the tree around its foot and removing the charred portion with their stone implements. This was continued until the tree fell. Then they marked the length to be given to the object, and resumed at the proper place the process of burning and removing. In a similar manner the hollowing of the tree was effected. But now a few strokes of the European axe did the same work which formerly, perhaps, required days; and to a race as indolent and averse to labor as the Indians, the effect of that simple tool must have appeared almost miraculous.

* Lafitau, *Mœurs des Sauvages Américains*, Paris, 1724, Vol. II, p. 332.

† Lawson, *History of Carolina*, London, 1714; reprint, Raleigh, 1860, p. 338.

Greater, however, than these and many other advantages were the evils which the contact with the whites brought upon them ; and in succumbing to the overwhelming power of the Caucasians, they shared the fate of every inferior race that takes up the contest with one occupying a higher rank in the family of men.

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